NETWORK WORLD

The Newsweekly of User Networking Strategies | Volume 5, Number 49 | December 5, 1988

AT&T offers new service backup plan

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — Less than a month after suffering a fiber-optic cable cut that paralyzed customer networks along the Eastern Seaboard, AT&T last week introduced an alternate routing feature for its T-1 and T-3 services.

With AT&T's Network Protection Capability (NPC), the carrier will reestablish service within two seconds after an outage in locations where alternate fiber transmission facilities are available.

NPC could have helped the company contend with the recent fiber outage in New Jersey by routing traffic through Buffalo, N.Y., and Philadelphia, an AT&T spokeswoman said.

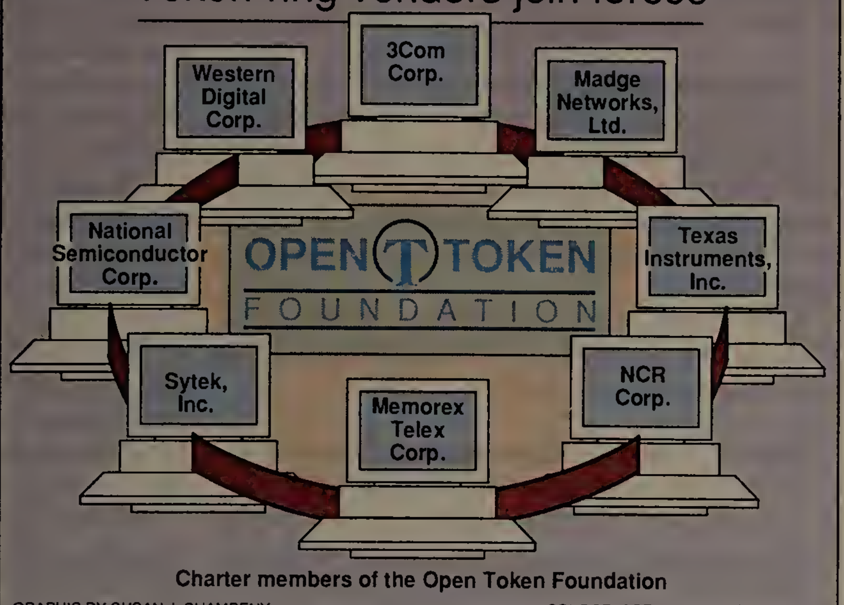
Switched and dedicated services were disrupted when a Consolidated Rail Corp. construction crew knocked out AT&T's main Eastern Seaboard fiber route on Nov. 18 ("Crippled by outage, users reevaluate AT&T service," *NW,* Nov. 28).

NPC will be available only for the intercity portion of circuits where separately routed fiber-optic lines are available, said Matthew Clark, Accunet T1.5 Service product marketing manager.

"We'd like to back up every [T-1 and T-3], but we're really at

(continued on page 49)

Token-ring vendors join forces



Charter members of the Open Token Foundation

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: OPEN TOKEN FOUNDATION

Network makers team up in token-ring association

Led by 3Com and Madge Networks, token-ring product vendors rally to ensure interoperability.

By Laura DiDio
Senior Editor

SANTA CLARA, Calif. — Vendors of token-ring network products last week announced the formation of a group that will work to ensure interoperability of products and lessen IBM's influence over the direction of the token-ring industry.

Eight vendors have already joined the nonprofit Open Token Foundation (OTF), founded jointly by 3Com Corp. and Madge Networks, Ltd. As many as 20 companies may attend OTF's inaugural meeting, which is being held at 3Com's headquarters here today.

In addition to 3Com and Madge Networks, initial OTF members include Memorex Telex Corp., National Semiconductor Corp., NCR Corp., Sytek, Inc., Texas Instruments, Inc. and Western Digital Corp.

OTF's goal is to ensure full compatibility among token-ring products. That has not always been the case to date, according to 3Com and Madge Networks officials. They contend that token-ring offerings are often built to mirror IBM's Token-Ring Network products, which sometimes differ from the IEEE 802.5 standard for token-ring nets.

(continued on page 6)

Users brainstorm on OSI migration

COS sponsors conference on implementation of open standard; users share their strategies.

By Barton Crockett
Senior Writer

MCLEAN, Va. — Users should ignore the hype surrounding Open Systems Interconnection but start planning for implementation of the open networking standard, said speakers at a conference on OSI migration hosted by the Corporation for Open Systems (COS).

The OSI Product Integration Conference, held here, was co-sponsored by COS and Advanced Computing Environments (ACE), a Mountain View, Calif.-based educational firm. Officials of COS and ACE said the conference was designed as a forum for users and vendors to discuss OSI implementation strategies.

About 400 people attended, and roughly half were users. Some of those users detailed their experiences with implementing OSI-based systems.

Attendees and speakers at the conference agreed that OSI will become the predominant network architecture in the future. But they warned that it may take decades for OSI to reach the level of acceptance forecast by some in the industry.

"Sure, OSI will be important," said ACE President Daniel Lynch. "But the question is, how long [will it take]? It could take 10 to 20 years before we get a full suite of mature OSI products."

Users agreed that the key to OSI migration is planning.

"For the next year or so, it's going to be rough sailing for those who promote OSI," said Eliot Christian, deputy chief of the office of systems management with the U.S. Geological Survey.

(continued on page 51)

ACE's Dan Lynch

Greyhound runs with new POS net

By John Cox
Senior Editor

WEST DES MOINES, Iowa — Greyhound Lines, Inc. is installing a microcomputer-based ticketing network that is already helping the bus company improve service, boost profits and offer passengers new price options.

The partially installed dial-up network will eventually link AT&T personal computers in some 700 Greyhound ticketing offices around the country to the company's data center here.

According to Richard Lambert, Greyhound's senior director of ticketing and data collection, the network is speeding up the ticketing process and helping keep buses on schedule. Greyhound will carry more passengers this year than last without adding new ticketing staff.

When complete, each of Grey-

(continued on page 50)

NETLINE

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TARIFF 12 PROBLEMS could stymie the GSA if it awards AT&T a piece of the FTS 2000 contract. Page 2.

VANDERBILT U. HOPES to save $60,000 per year by using direct T-1 connections to AT&T. Page 2.

CONGRESS SLAPS the FCC's price cap plan. Page 3.

A $6.7B WRITE-OFF will cause AT&T its first-ever annual loss. Page 3.

THE DEFENSE DEPT. takes evasive action after a hacker gains access to MILNET. Page 6.

POORLY PLANNED E-MAIL purchases can saddle a company with incompatible systems and isolated staff. Page 28.

NEWSPAPER

FEATURE

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E-mail systems feature gateways, fax capability

By John Hunter
Contributing Editor

Electronic mail is a convenient alternative to manual, paper-based distribution of memos and other short messages. Enlightened managers, however, view E-mail as a strategic system that can be integrated with facsimile and other messaging systems to enhance productivity.

At one time, all E-mail users depended on public services such as AT&T's AT&T Mail and Western Union' Corp.'s Easylink, but that's no longer the case. Many user companies have established private E-mail nets, and gateways are extending the reach of E-mail to allow diverse public and private systems to exchange messages.

This doesn't mean, however, that all E-mail limitations have

(continued on page 35)

Datacom BUYER'S GUIDE

FTS 2000 contract award may not calm controversy

If AT&T is one of the victors, it may use Tariff 12 to fulfill bid, a move likely to bring more delays.

By Anita Taff
Senior Correspondent, Washington

WASHINGTON, D.C. — The controversy surrounding the Federal Telecommunications System (FTS) 2000 network may not end this Saturday when the U.S. General Services Administration is scheduled to award the FTS 2000 contract.

If AT&T is named one of the two winning bidders, it will likely file a Tariff 12 plan for the custom services it will provide under FTS 2000, according to sources in the GSA and the Federal Communications Commission, as well as rival bidders.

But using Tariff 12 as a vehicle for FTS 2000 services could cause new problems for the GSA, which has already encountered a number of delays in awarding the contract. Most of the custom network plans filed by AT&T under Tariff 12 are currently under investigation by the FCC. It is possible FTS 2000 could also be investigated and ultimately found unlawful.

The FTS 2000 contract, which will upgrade the aging federal telecommunications system, will be worth up to $25 billion in voice, data and video services over a 10-year period.

The contract asks for six specific service categories: switched voice and 4.8K bit/sec switched data; 56K and 64K bit/sec switched data; switched digital integrated service at speeds up to 1.544M bit/sec; packet-switched data transmission; compressed and wideband video; and private-line transmission for voice and data.

The FTS 2000 contract was opened to bidders in December 1986, and bids were originally scheduled for submission on June 30, 1987. But the contract has been plagued by a variety of problems, including delays in bid submissions and bid withdrawals.

The FCC and the courts were brought into the FTS 2000 proceedings along the way. The GSA asked the FCC to exempt FTS 2000 services from tariff procedures, and AT&T petitioned U.S. District Court Judge Harold Greene, seeking to bar the regional Bell holding companies from working with rival bidders.

Congress also intervened in the bidding process, requiring the GSA to split the contract between two contractors on a 60:40 basis rather than award the entire network deal to one vendor.

Three bidding teams are now in contention for the contract: AT&T and Boeing Computer Ser-

(continued on page 6)

Vanderbilt opts for T-1 links to point of presence

University expects to save $60,000 annually.

By Rex Bowman
West Coast Correspondent

NASHVILLE — Vanderbilt University hopes to save almost $60,000 per year in 0+ long-distance calling expenses by using direct T-1 connections to link its campus here to a local AT&T point of presence.

The connections, which Vanderbilt began testing on Nov. 1, may eventually give AT&T a new weapon to use in its ongoing battle with firms that provide alternative operator services (AOS).

Using dedicated T-1 links leased from South Central Bell Telephone Co. instead of switched facilities will save Vanderbilt an estimated $33,400 per year in 0+ local access charges. The school expects to save an additional $25,000 per year by eliminating phone fraud.

The T-1 lines tie Vanderbilt's private branch exchange into an AT&T Traffic Service Position System (TSPS) used to support operators.

All 0+ calls from the campus's 12,000 phones are routed over the T-1s to the TSPS, which has been modified with new software developed by AT&T that allows the TSPS to work with the school's PBX.

If the direct connection service proves workable, AT&T could begin offering it to other large users of operator-assisted calls, such as hospitals and hotels, as early as next spring, according to Louis Molettiere, marketing manager for AT&T in Tennessee.

"It will clearly help us compete in the marketplace, but it's not going to drive AOS companies out of business," Molettiere said. "It's intended to meet the needs of the highest volume users who ask for direct access."

Vanderbilt fits that description. Last October, the school's approximately 9,000 students placed 24,990 operator-assisted calls, for a total of 239,807 minutes, according to Ted Vagelos, the school's assistant director of telecommunications. Operator-assisted calls represented 20% of all long-distance calls made by students in October, he said.

(continued on page 51)

Briefs

Apollo slapped with suit. Netherlands-based Willemijn Holding BV said last week it has sued Apollo Computer, Inc. in Delaware's U.S. District Court for infringement of its Soderblom local net technology patents. Willemijn Holding said it intends to vigorously pursue enforcement of its patents and licensing terms, adding that its patent is one of the most tested in the history of the U.S. Patent Office. Terms of the lawsuit were not disclosed.

Tumbling down. Following AT&T's lead, US Sprint Communications Co. last week said it will reduce its Dial 1 long-distance rates an average of 3.75% for business customers effective Jan. 1. The cuts were made possible by a decrease in local access charges announced by the Bell operating companies on Oct. 3.

AT&T's $697 million rate cut took effect last week. US Sprint said it has pared long-distance rates 26% since it was formed on July 1, 1986.

Codex trims a little more. Codex Corp. announced last week that it cut 56 of its 4,200 jobs by merging portions of its engineering and manufacturing groups involved in product development. A spokesman for the Canton, Mass.-based company said the jobs, which represent 1.3% of its work force, were eliminated to reduce the time and cost of bringing new products to market.

"It's really part of an ongoing streamlining effort in the company more than anything that's born out of a financial necessity or crisis," the spokesman said.

Last July, Codex laid off 280 workers. It cited slowed sales of its modems and multiplexers — the company's traditional mainstays — as the reason behind the layoffs.

Unix group named. The recently formed vendor association trying to develop a standard version of AT&T's Unix System V operating system last week announced its official name: UNIX International, Inc. The group is composed of 29 computer and software companies, including AT&T, Data General Corp., Fujitsu Ltd., Intel Corp., NCR Corp., NEC Corp., Prime Computer, Inc., Sun Microsystems, Inc. and Texas Instruments, Inc.

The group also appointed a new chairman, Donald Herman, a retired senior executive of NCR and founding chairman of the Corporation for Open Systems.

FCC releases strategic pricing text. The Federal Communications Commission last week released the full text of its Oct. 13 decision to allow the regional Bell holding companies to employ strategic pricing for special access tariffs.

Because special access tariffs apply to private-line services and other special services, the commission ruled that strategically pricing access to these services could help prevent bypass and customer migration from switched public services.

Opponents have claimed that special access tariffs have been grossly overpriced. In the order, the FCC acknowledged that access rates for some individual high-capacity services have been set to earn a return of between 116% and 33%. The designated rate of return for the special access category is 12%.

CONTENTS

Industry Update

Manufacturers of TSATs — very small aperture terminals that handle data at T-1 speeds — say declining rates for terrestrial T-1 service may stifle growth of the fledgling TSAT industry. **Page 9**

Telecommunications

In its dogged pursuit of AT&T and with a wary eye on US Sprint, MCI is enriching its long-distance network to deliver advanced voice and data services to its customers. David Link, network engineering vice-president for MCI, discusses the evolution of his company's network. **Page 11**

Data Communications

Something new will soon be available in transatlantic wideband digital communications: a choice. **Page 13**

Local Networking

A design glitch that rendered Proteon's 4M bit/sec token-ring Media Access Units inoperative in certain circumstances has been identified and fixed. **Page 17**

Management Strategies

A recent cut in a major AT&T fiber-optic route has heightened awareness among users of the vulnerability of fiber lines and reinforced their commitment to diversifying networks by using multiple carriers. **Page 19**

Products & Services

NSA last week announced gateway software for IBM Personal Computers and compatibles as well as for Personal System/2s supported by token ring or other Network Basic I/O System-compatible local networks. **Page 21**

Inside

Opinions **26**
Letters **27**
Networking Marketplace **42**
Computer Careers **43**
Calendar **50**

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Network World
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
(508) 820-2543

Second-class postage paid at Framingham, MA, and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue the last two weeks in December by Network World Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-620-7760.

Non-qualified subscribers: $3.00 a copy; U.S. — $95 a year; Canada, Central & South America — $110 a year; Europe — $165 a year, all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label appearing on front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

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POSTMASTER: Send Change of Address to *Network World*, Box 9172, Framingham, Ma. 01701-9172.

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Congress says FCC price cap plan legally unsound

By Anita Taff
Senior Correspondent, Washington

WASHINGTON, D.C. — The Federal Communications Commission does not have the authority to implement its proposed price cap regulation plan, according to a legal analysis released recently by the U.S. House of Representatives Subcommittee on Telecommunications and Finance.

The analysis was the latest blow from Congress in the heated battle over price caps. Earlier in the year, Congress held a number of hearings in which FCC Chairman Dennis Patrick was admonished not to move ahead too quickly with the plan.

Sources within the FCC had speculated that the commission would address price caps at a meeting scheduled for Dec. 2, but the meeting was canceled after the analysis was released.

The Communications Act of 1934 requires the FCC to assure that rates are just and reasonable. Staff members of the Telecommunications and Finance Subcommittee concluded that this can only be accomplished by basing prices on the cost of providing service. Carriers are currently allowed to recover their costs plus a predetermined 12% profit.

Price cap regulation abandons the method of cost-based pricing, the report said. The proposal would place a ceiling on the rates carriers can charge for services, rather than placing a ceiling on profit levels.

The commission has stated that once the caps are in place, carriers may improve their profits by becoming increasingly efficient and thereby cutting the cost of operation. Under such a plan, prices would no longer be based on costs.

Although the Communications Act does not expressly mandate cost-based regulation, the subcommittee said that historically Congress has insisted on such regulatory schemes. The report also lists a number of instances in which the FCC itself has ruled that the determination of just and reasonable rates should be based on the cost of providing service.

In a 1976 ruling on AT&T's WATS service, the FCC is quoted as saying "that costs of providing service are at the heart of the statutory requirement of the [Communications] Act for just, reasonable and nondiscriminatory charges."

AT&T releases plans for wider availability of PRI

Service will be offered in 60 cities by mid-'89.

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — Eight months after tariffing the nation's first Integrated Services Digital Network Primary Rate Interface service, AT&T last week said switching offices in 60 cities will support the Primary Rate Interface by mid-1989.

According to AT&T, 44 cities will be added to the list of 16 cities where Primary Rate Interface and advanced Primary Rate Interface-based calling features are currently offered. In addition, the Primary Rate Interface service will be supported by central offices in an unspecified number of additional cities in the second half of 1989. AT&T would not name any of those cities that will be added.

User demand for ISDN is soaring, according to AT&T, which said 140 corporations, schools, and state and local governments across the U.S. are planning to implement the service. The company declined to say when users will implement the ISDN service.

Expansion of the availability of the Primary Rate Interface service follows the completion of its eight-month controlled introduction, during which a select group of AT&T customers used the service in production applications.

Participants, including American Express Travel Related Services Co. and WATS Marketing of America, Inc., said ISDN greatly improved the efficiency of their telemarketing and customer service operations.

The carrier said the Primary Rate Interface cities have been chosen and will continue to be chosen based on user demand for the service.

"We are not [deploying the Primary Rate Interface] based on an engineering algorithm or network model, but rather by actual customer demand," said John Kauza, ISDN product management director for AT&T.

Wide user interest

User interest in the Primary Rate Interface has crossed vertical industry boundaries, Kauza said. "We initially thought [most] interest would come from telemarketing companies and from financial institutions," he explained. "But we are finding that the market is broader." Retail chains and heavy industry have expressed strong interest in ISDN, he said.

> "We are not [deploying the Primary Rate Interface] based on an engineering algorithm or network model, but rather by actual customer demand," said AT&T's John Kauza.
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The Primary Rate Interface specifies how users can implement a T-1 link configured to CCITT standards to hook customer premises equipment, such as private branch exchanges, to a carrier's long-distance network. With the Primary Rate Interface, a T-1 link supports 23 64K bit/sec channels for voice and data communications, and one 64K bit/sec channel for carrying packetized data used to control the 23 channels.

Analysts said the two Primary Rate Interface-based service features currently offered by AT&T — INformation FOrwarding-2 (INFO-2) Automatic Number Identification (ANI) and Call-By-Call Service Selection — boost worker productivity and cut access line costs.

INFO-2 provides the called party with the telephone number of the calling party. The feature is available on calls originating from local exchange carrier offices equipped for equal access or centralized automated messaging accounting — an older billing scheme still in use.

"[INFO-2] is a very attractive feature for companies that want to enhance their customer service applications," said Ian Angus, president of Angus Tele-Management Group, Inc., a Pickering, Ont.-based consulting firm.

INFO-2 enables telephone agents to handle incoming calls faster by reducing the amount of time needed to identify callers and access their account records, Angus said.

American Express Travel Related Services, AT&T's first Primary Rate Interface user, said it received ANI with 72% of its calls and said the service cut the average time per call ("Amex details experience with ISDN at user meet," Oct. 3).

A second early Primary Rate Interface user, WATS Marketing, said it expects INFO-2 to enable it to handle one million additional

(continued on page 49)

AT&T faces first annual loss due to $6.7b charge

Carrier writes off analog facilities as it steps up digitization of network; announces new layoffs.

By Bob Brown
Senior Writer

NEW YORK — As part of an effort to step up the digitization of its network, AT&T last week said it will take a $6.7 billion pretax charge against fourth-quarter earnings, a move that will result in the first annual loss for the 103-year-old company.

The analog network equipment the company is writing off and ancillary charges will reduce AT&T's net income $3.9 billion, or about $3.60 per share after taxes in the fourth quarter. AT&T last reported a fourth-quarter loss in 1986.

AT&T earned $2.04 billion on $33.6 billion in revenue last year and will lose about $1.7 billion this year, according to analysts. Earnings for the first nine months of the year were 10% ahead of the same period last year.

Of the $6.7 billion write-off, $5 billion will be for analog network switches and transmission facilities. The company said in October that it was studying how best to shed these assets, either by writing them off or by accelerating their depreciation.

With the decision to write off the equipment, the company also said it would write off $600 million worth of other equipment, including radio towers, test equipment and tools used to support the analog part of the network. AT&T said it will take an additional $700 million charge to cover the cost of removing the analog plant, a process expected to extend into 1993.

Another $400 million charge will cover the cost of transferring or paying separation payments to about 10,000 network operations group employees through 1993 and up to 6,000 operator service employees by early 1991. The company previously announced the operator service job cuts and 3,000 of the network operations cuts.

Fewer technicians and engineers will be needed to maintain the network because of improved self-maintenance resulting from digitization. AT&T said it will attempt to avoid outright layoffs through retraining, redeployment and normal attrition.

In anticipation of the news of the carrier's plans, AT&T's stock on the New York Stock Exchange rose seven-eighths of a point to $29 7/8 a share last Wednesday. The stock dropped half a point last Thursday, closing at $29 3/8 a share, as stockholders took their profits.

AT&T said it is moving faster than planned with its digitization process because customers are eager to take advantage of new voice, data and video services. Part of the equipment to be written off is being obsoleted by an AT&T Bell Laboratories-developed software product that enables AT&T network central office switches to favor digital routes.

But analysts attributed the accelerated digitization plans to competitive pressure from MCI Communications Corp. and US Sprint Communications Co.

"I think the digitizing is in response to MCI and Sprint," said Bob Wilkes, a telecommunications analyst at brokerage firm Brown Brothers Harriman & Co. in New York. "It's the competitive necessity of having digital."

An AT&T spokeswoman said this was not a major factor. But Morris Tanenbaum, AT&T's vice-chairman and chief financial officer, said the "digitization program strengthens our competitiveness and improves our earnings potential — now and in the future."

> AT&T will lose approximately $1.7 billion this year, according to analysts.
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AT&T's digitization plan calls for 95% of its domestic switched traffic to be carried on digital facilities by mid-1989, increasing to 100% by the end of 1990. Currently, about 85% of AT&T's traffic is carried over digital facilities, the spokeswoman said.

AT&T's estimate of when the company would be 95% digital has changed several times in the past two years, Wilkes said. AT&T said at the beginning of 1987 that it would be 95% digital by 2010. As of November 1987, AT&T said it would be at that level by 1991, he said.

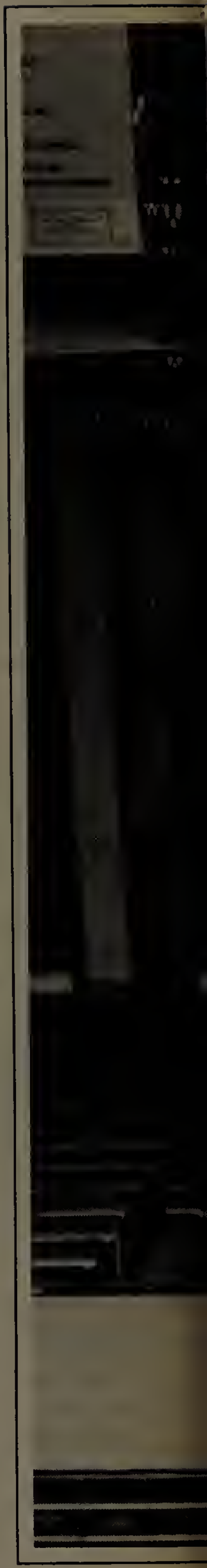
AT&T is holding its annual year-end meeting with the New York Society of Securities Analysts today. According to a spokesman, AT&T Chairman Robert Allen is expected to talk about the company's performance in the past year and its prospects for the future.

Correction: In an article entitled, "Merrill Lynch buys into vendor of network security products" (*NW,* Nov. 21), Robert Morris was incorrectly identified as a cofounder of Micronyx, Inc. Morris is an acquaintance of Micronyx founder George Goode.

“You’ve got the best computers and the most reliable network in the world, but your data transmission still gets garbled.

Maybe you’re buying the wrong modems.”

—Ed Hines, Engineering and Quality Director of
AT&T manufacturing plant, Montgomery, Illinois



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Defense net ties severed after breach

By Rex Bowman
West Coast Correspondent

WASHINGTON, D.C. — The Department of Defense last week severed the links between the unclassified Military Network (MILNET) and the Advanced Research Projects Agency Network (ARPANET) after it learned that a hacker had broken into at least one computer on MILNET.

The Pentagon's Defense Communications Agency said the electronic mail connections between ARPANET and MILNET were broken at 10 p.m. on Nov. 28 after Mitre Corp., based in Bedford, Mass., discovered that one of its MILNET-linked computers had been accessed by an unauthorized user.

Jon Rochlis, assistant network manager at the Massachusetts Institute of Technology, said the Defense Communications Agency broke the connections because it believes the attack came through ARPANET and because of fears that other MILNET computers were being attacked.

In a brief written statement, the defense agency said only that it had broken the connections "to provide a barrier to protect [MILNET's] users."

The security breach came less than a month after a hacker unleashed a computer virus that spread from ARPANET throughout Internet, a wide-area network linking research nets such as ARPANET, MILNET and the National Science Foundation Network. In that case, the hacker's virus penetrated thousands of computers by taking advantage of security flaws in Unix System 4.3 ("Virus victims are stoic in wake of multinet attack," *NW*, Nov. 14).

A spokeswoman for Mitre, which has several defense contracts, declined to comment on the exact nature of the illegal entry into one of its VAX computers. She did say the company reprogrammed unspecified software that allowed the hacker to gain entrance within hours after the intrusion was discovered. She also said no information on the VAX was classified or damaged.

MILNET and ARPANET were reconnected on Wednesday, Nov. 30, but disconnected again shortly thereafter. The Defense Communications Agency, which had said it intended to reconnect the nets on Dec. 1, declined to comment on why it severed network ties a second time. The nets were connected late Thursday night.

Agency officials said the hacker gained entry by exploiting a weakness in the VAX's software. "It's safe to say it was a hacker problem, not a virus problem," said Air Force Lt. Col. Tom Horton, assistant chief of staff of the Defense Communications Agency. Horton refused to elaborate.

ARPANET is a nationwide network of business and university research computers. MILNET, a network linking hundreds of defense contractors' computers and computers at military installations, is connected to ARPANET via seven mailbridges.

Initially, the Defense Communications Agency said it cut the connections as a result of technical difficulties. But after university researchers noticed messages could not be passed between ARPANET and MILNET, they pressed the agency for more information. The Defense Communications Agency confirmed on Dec. 1 that its action was security-related.

Clifford Stoll, a computer security expert and an astrophysicist at Smithsonian Astrophysical Observatory working at the Harvard University campus in Cambridge, Mass., said the hacker took advantage of the so-called anonymous file-transfer program of certain Unix operating systems. This method was similar to that used by the hacker who created the Internet virus, he said.

The anonymous file-transfer system lets anyone log on to the computer to retrieve files. For instance, an executive who wanted to make a file available to every computer user in a company could store the file and designate it for anonymous transfer. Anyone who wanted to retrieve it could then do so anonymously.

Stoll said, however, that hacker activity has shed light on the relationship between computers and networks. "This emphasizes that networks are not separate from computers. A security problem on a network causes headaches for computer people, and a security problem on computer software causes headaches for network folk."

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Net makers team up in association

continued from page 1

Robert Madge, president of Madge Networks, said OTF will conduct independent testing of token-ring products to verify that they conform to IEEE specifications. It will also publish a monthly newsletter and hold quarterly forums on the latest product and marketing developments in the token-ring market.

There are no current plans for any cooperative research and development efforts among the member token-ring vendors, said Bill Swift, 3Com product line manager for token-ring products.

OTF also hopes to demonstrate practical examples of token-ring interoperability at end-user sites, Madge said.

To date, contact with token-ring users has been limited. But in coming weeks, OTF will actively recruit users for membership.

"The Open Token Foundation is a chance for other companies and end users to have a voice in formulating the token-ring standard," Madge said. "Until now, everything has revolved around IBM. That's an untenable position for the rest of the industry because if IBM changes its product, the standard changes as well."

Big Blue has a 90% share of the market for token-ring networks, according to statistics supplied by market research firm International Data Corp. in Framingham, Mass.

Some examples

Madge cited examples where IBM products caused problems for other vendors. He said IBM 3270 emulation and Advanced Program-to-Program Communications software worked only with IBM's Token-Ring Adapter boards.

It took nearly a year for vendors and users to realize the problem, according to Madge. Once they became aware of the incompatibility, they spent considerable time and money to reverse-engineer their boards to comply with IBM's specifications.

IBM, Madge added, "doesn't test its products with other vendors' hardware. So even though IBM says it supports open systems, IBM products can accidentally become closed systems if there's no independent testing and verification."

Both Swift and Madge, who conceived the idea for OTF last August, said the consortium will not be used as a vehicle to gang up on IBM. In fact, they said, IBM has been asked to join the fledgling consortium. "We're pro-token ring, not anti-IBM," Swift said. "IBM hasn't given us an answer yet, but I think the chances are excellent that IBM will join us."

An IBM spokesman told *Network World* that, while no formal decision has yet been made, "We are favorably disposed to joining OTF and we fully support open systems."

Besides IBM, the other big question mark is Apple Computer, Inc. Apple is expected to introduce its own token-ring product in mid-1989, and Macintosh connectivity is a priority for vendors and users. "We're taking a wait-and-see attitude toward OTF. We don't know enough about it yet and haven't made a decision on whether we'll join," a spokesman for Apple said.

Firms joining OTF will be charged a membership fee. Neither Swift nor Madge would specify the exact amount.

Swift also said that in order to maintain objectivity, OTF will use an independent consulting firm, Architecture Technology Corp. of Minneapolis, to handle administrative functions.

"We wanted them because they're neutral." Swift said. "Architecture Technology has already written a business plan for us, and although it's not definite yet, OTF headquarters could be at their offices in Minneapolis."

Award may not calm controversy

continued from page 2

vices Co.; Martin Marietta Corp., MCI Communications Corp. and Northern Telecom, Inc.; and US Sprint Communications Co.

Shortly after the GSA released FTS 2000 for bids, it expressed concern that AT&T could not guarantee fixed rates, a primary contract requirement. The agency sought unsuccessfully in June 1987 to have the FCC remove the tariff requirements for FTS 2000, which means FTS 2000 services provided by AT&T will be subject to rate changes.

The FCC rejected the GSA petition in part because the award of FTS 2000 was pending and it was not certain that AT&T would win. However, the commission left open the possibility that the GSA could resubmit the petition after the contract was awarded.

Because FTS 2000 services were left under FCC jurisdiction, AT&T must file a tariff for the offering. The long-distance carrier could either file a new tariff specifically for FTS 2000, or it could offer those services under an existing tariff.

A source at the GSA who requested anonymity said that AT&T has discussed Tariff 12 as an option for FTS 2000.

In addition, a number of attorneys and analysts familiar with the contract have speculated that AT&T may offer FTS 2000 as a custom network under Tariff 12. "Tariff 12 is the logical repository for FTS 2000," said Don Elardo, general counsel for MCI.

John Hoffman, vice-president of external affairs at US Sprint, said he suspects AT&T will file FTS 2000 under Tariff 12, although he emphasized that he had no direct knowledge of AT&T's intentions.

The possibility of AT&T filing for FTS 2000 under Tariff 12 was also acknowledged by two sources at the FCC and an independent analyst who was involved in early work on the FTS 2000 contract. The analyst, who asked not to be named, described FTS 2000 as a digital network that offers bundled services charged on a per-minute basis, adding, "That's all Tariff 12 networks are."

> "Tariff 12 is the logical repository for FTS 2000," MCI counsel Don Elardo said.
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A source on a competing bidding team, who also requested anonymity, said AT&T's Tariff 12 offering for General Electric Co. bundled services in the manner outlined in FTS 2000. The GE plan was filed in March 1987, three months after FTS 2000 was opened for bids. Some observers speculated AT&T was preparing Tariff 12 as a vehicle for the FTS 2000 contract.

An AT&T spokeswoman confirmed that the company must file a tariff if it wins part of FTS 2000. But she declined to comment on the type of tariff AT&T would use to offer FTS 2000.

It is not certain that the FTS 2000 network would encounter regulatory problems if AT&T submits a Tariff 12 plan, although four of the six plans filed are currently under investigation. The first Tariff 12 network, designed for the Department of Defense in 1985, went into effect with no investigation. The most recent Tariff 12 filing, for American Airlines, Inc., has drawn fire from US Sprint, the Independent Data Communications Manufacturers Association and MCI, and it may be investigated.

Hoffman pointed out that the GSA could have problems if AT&T wins the contract on the basis of price and the prices in Tariff 12 are found to be unlawful.

However, even if the FCC finds some of AT&T's Tariff 12 deals to be unlawful, the commission's moves will not necessarily affect FTS 2000 if the unlawful plans are substantially different from FTS 2000, Elardo said.

The GSA source agreed that the FCC could find some Tariff 12 arrangements to be unlawful without affecting FTS 2000 services. However, the source expressed optimism that FTS 2000 would not get caught in regulatory limbo because the more times the FCC allows Tariff 12 plans to take effect, the more difficult it would be for the FCC to declare the tariff unlawful.

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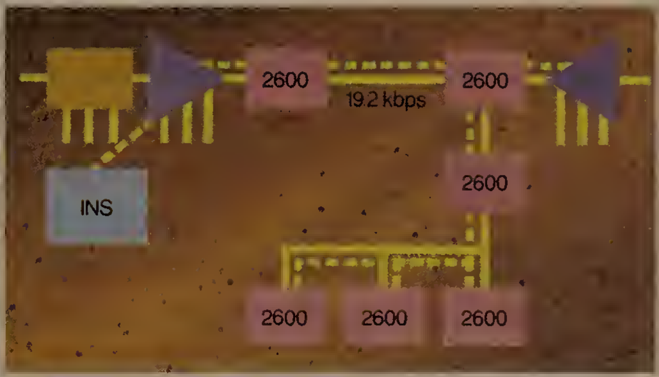

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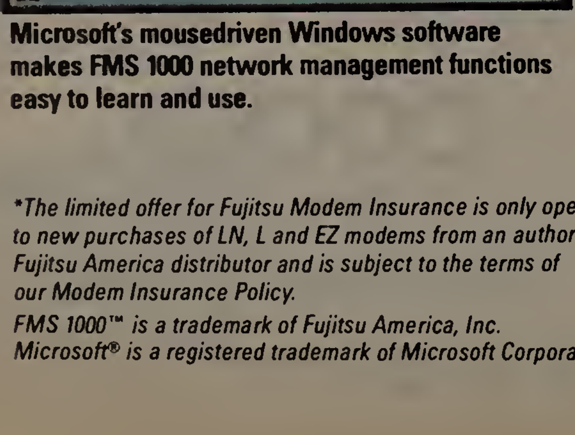

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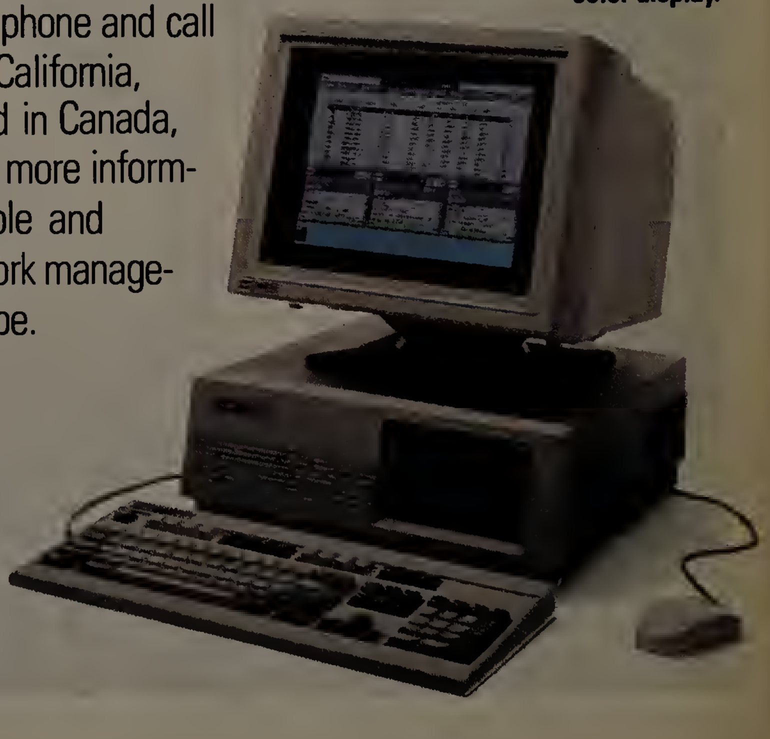

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

"Without universal internetworking standards, there is no information age. Interface standards are essential to control what could be chaos in a world of many suppliers, many users, many functions and many technologies."

Irwin Dorros
Executive vice-president
— technical services
Bell Communications
Research, Inc.
Speaking at the Ninth
International Conference
on Computer Communications
in Tel Aviv, Israel

People & Positions

Digital Microwave Corp. of San Jose, Calif., recently reassigned a number of senior executives.

John McGuire, executive vice-president, will now have primary responsibility for international marketing and sales operations. **Donald Williams** has been promoted to senior vice-president and will be responsible for the transfer of product technology to DMC Telecom, Ltd.

William Palumbo was promoted to vice-president of sales and marketing with primary responsibility for U.S. marketing and sales.

Yoshitaka Taniguchi was promoted to vice-president of manufacturing and is in charge of all product manufacturing in Digital Microwave's San Jose facility.

Digital Microwave is a supplier of short-haul transmission products.

Sytek, Inc. recently named **Len Palmer** director of strategic planning. Palmer will be responsible for long-range planning of Sytek's products and business strategy. Prior to joining Sytek, Palmer was vice-president of marketing for Novell, Inc.'s communications division.

Unix sales predicted to rise by 25%

By Rex Bowman
West Coast Correspondent

FRAMINGHAM, Mass. — Despite the multiplicity of Unix versions, sales of Unix-based hardware systems will far outpace sales of other products, according to a report published recently by International Data Corp. (IDC), a market analysis firm based here.

The IDC report predicts that Unix hardware sales will grow, on average, 25% annually through 1992. (By comparison, IDC is forecasting a 10% growth rate for the computer industry overall through 1992.) U.S. vendors of Unix hardware will have a combined gross revenue of about $21 billion in 1992, compared with $6.8 billion in 1987.

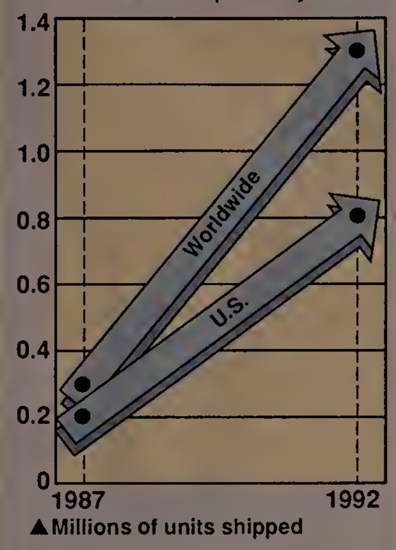
According to IDC, Unix will play a major role in the future of networking because it runs on a variety of processors and provides common communications capabilities through support of Transmission Control Protocol/Internet Protocol.

Despite rapid growth in sales, Unix-based hardware will account for only 5% of all computers shipped worldwide by 1992, said Vicki Brown, director of systems research for IDC. "We're not predicting that Unix will take over the world," she said.

Brown cited increasing availability of Unix-based applications as a key reason why sales of Unix hardware will increase dramatically.

Unix on the rise

Projected shipments of Unix-based computer systems



SOURCE: INTERNATIONAL DATA CORP. FRAMINGHAM, MASS.
GRAPHIC BY SUSAN SLATER

She also noted that applications portability — the ability to move applications running on one Unix system to another Unix-based system — will tempt even more users to abandon proprietary operating systems.

Brown acknowledged, however, that there are some obstacles ahead for Unix. For instance, users of supercomputers and mainframes, such as the IBM 3090, will continue to resist Unix. "They figure, if what they have works, why make the switch to Unix?" Brown said.

Another impediment to growth in the Unix market could be the ongoing battle over a future standard version of the operating system.

Contestants in that battle include the Open Software Foundation, whose members include IBM, Digital Equipment Corp. and Hewlett-Packard Co., and the Archer Group, whose members include AT&T, Sun Microsystems, Inc. and Unisys Corp.

INDUSTRY BRIEFS

Rabbit Software Corp. of Malvern, Pa., recently signed a licensing agreement with **Motorola, Inc.'s Computer Systems Division** in Cupertino, Calif.

Under terms of the agreement, Rabbit Software will provide Motorola with its data communications products for use in Motorola's System 8000 supermicrocomputer product line. The products will link System 8000 computers to IBM hosts using IBM's Systems Network Architecture protocol.

Datatronics S.A. de C.V. (DASA), a Mexican government company co-owned by the national airlines Mexicana and Aeromexico, recently awarded a contract to **Unisys Corp.** of Blue Bell, Pa., for reservation terminals, printers and communications equipment.

DASA has contracted with Unisys to replace its existing terminals with 4,000 Unisys Airline Terminal System workstations over the next two to three years.

NCR Corp. of St. Paul, Minn., recently signed a four-year, $8 million marketing agreement with **VeriFone, Inc.** of Redwood City, Calif., to sell its data collection terminals.

NCR's Data Pathing Group will market VeriFone products in the U.S. under the name NCR 2725 Data Collection Terminal.

T-1 price war dims outlook for TSATs

T-1 VSAT makers fear effects of price slashing, pin hopes on potential in disaster recovery field.

By Rex Bowman
West Coast Correspondent

Manufacturers of so-called TSATs — very small aperture terminals that handle data at T-1 speeds — say declining rates for terrestrial T-1 service may stifle growth of the fledgling TSAT industry.

Currently, only about five VSAT manufacturers market TSAT products. The firms say TSATs are ideal for businesses with many branch locations far from central offices. But rate reductions, such as those filed two weeks ago by AT&T for its Accunet T1.5 service, make terrestrial T-1 services more attractive than TSATs, which can cost anywhere from $17,000 to $30,000 per dish. (The rate reduction AT&T proposed amounts to a 25% decrease for a typical 300-mile-long T-1 line, AT&T said.)

According to Steve Sazegari, a senior voice analyst with Dataquest, Inc., a San Jose, Calif., communications research firm, T-1 service providers are in the midst of a pricing war. Users can expect MCI Communications Corp. and US Sprint Communications Co. to follow AT&T's lead, even though their T-1 services are still cheaper than AT&T's.

According to makers of TSATs, their industry could be a casualty of the T-1 price war.

Competition for T-1 business among the carriers "is going to be a threat," said Frank McCarthy, vice-president of marketing and sales for Vitacom Corp. of Fremont, Calif., which makes TSATs and offers T-1 satellite services. "The competition [between interexchange carriers] is going to inhibit market growth to some extent," he said.

A good candidate for a TSAT network, according to analysts and manufacturers, is a business with an existing VSAT network and the need to move data at the T-1 rate, 1.54M bit/sec. The seemingly logical approach is to upgrade the VSATs to TSATs.

Upgrading VSATs to TSATs can be simple or difficult, depending upon the kind of VSAT and the satellite involved, but it is "basically an engineering problem," said George Moy, president of George Moy Associates, a Gaithersburg, Md.-based communications consulting firm.

TSAT networks have several advantages over terrestrial T-1 services, TSAT makers say. First, satellite communications is not distance-sensitive: With satellites, it costs as much to send data 1,000 miles as it does to send it 100 yards.

Also, TSATs can be used more efficiently for point-to-multipoint applications, such as videoconferencing. Because a satellite's "footprint" can cover a wide area, one broadcast from Chicago, for example, can be beamed to hundreds of sites in the U.S. Businesses that transmit video signals to several cities over terrestrial T-1 lines, though, incur heavy mileage costs.

TSAT makers also contend that, although transmission delay is inevitable, the error rates of satellite transmission are comparable to those of terrestrial lines.

Perhaps the best publicity the TSAT industry received was the fire earlier this year at Illinois Bell Telephone Co.'s Hinsdale central office.

McCarthy said more corporations are looking at TSATs as a disaster recovery product.

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"Ever since the [Hinsdale] central office fire, a lot of companies are looking at T-1 VSATs for disaster recovery," said Philip Arcoria, satellite communications marketing manager for NEC America, Inc. of Herndon, Va. "So we know there is a market out there. But it's kind of a limited market."

NEC America has sold TSATs since March, with what Arcoria called moderate success.

Vitacom's McCarthy agreed that more corporations are beginning to look at TSATs as a disaster recovery product.

"A fuse coming out in Boston or a fire breaking out in Hinsdale, those things make telephone company-based T-1 access less attractive," said Steve Kropper, senior consultant in the telecommunications program of International Data Corp., a Framingham, Mass.-based communications research firm.

He added, however, that for the foreseeable future, the TSAT market will grow at a much slower pace than the VSAT market. "Right now," Kropper said, "the TSAT market is insignificant."

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TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

Nintendo of America, Inc., a Redmond, Wash.-based video game manufacturer, is using an automatic call distributor (ACD) to support 200 telephone agents fielding calls from 10 million game owners. Aspect Telecommunications Corp., a San Jose, Calif.-based telecommunications equipment vendor, sold the ACD to Nintendo.

Carrier Watch

Siemens Public Switching Systems, Inc. has shipped the first digital switch assembled at its Hauppauge, N.Y., manufacturing plant. Ameritech subsidiary **Illinois Bell Telephone Co.** bought the 10,000-line DE-4 switch for installation in its Cahokia, Ill., central office.

About 60% of the switch was actually manufactured at the Hauppauge plant. The other 40% was built at the Bruchsal, West Germany, facilities of parent company Siemens AG. Siemens said its U.S. manufacturing operations illustrate its commitment to winning a larger share of the U.S. market.

Siemens said it is pouring more than $100 million annually into Siemens Public Switching Systems for software adaptation, research and development, and construction of permanent manufacturing facilities. The company hopes its U.S. operation will manufacture equipment supporting up to 300,000 lines between Oct. 1, 1988, and Sept. 30, 1989.

Siemens has sold its digital electronic switches in the U.S. since 1985 and has approximately 100,000 lines of such equipment already installed here, a company spokeswoman said. Another 250,000 lines are on order.

Metro call plan aids Tenn. users

By Bob Brown
Senior Writer

NASHVILLE — A new metropolitan-area calling plan recently mandated by the Tennessee Public Service Commission (PSC) promises to save about 500 major South Central Bell Telephone Co. business users a total of $6 million a year.

The plan, which was negotiated by the Tennessee PSC and South Central Bell as a way to reduce the Bell operating company's earnings, will extend local calling areas and reduce toll traffic. It is scheduled to be phased in during 1990.

Local business users told *Network World* that, under the new plan, they will be able to cut down on private lines used to link area offices in favor of less expensive South Central Bell dial-up facilities.

The PSC determined that, based on South Central Bell's recently filed tariffs for 1989, the BOC would be making $104 million more than it is allowed under rate-of-return regulations.

The plan covers communications for four Tennessee cities — Nashville, Chattanooga, Knoxville and Memphis — and their surrounding counties. The plan will allow users in a metropolitan calling-area hub, such as Nashville, to call any bordering county for the cost of a local call. Those calls are currently billed as long-distance calls.

The calling plan will not be implemented until 1990 because the local exchange switches must be programmed to accommodate the change. The plan will go into effect in different metropolitan areas as facilities become available, a PSC spokeswoman said.

"Rather than reducing the revenue by ordering a refund to users, the Public Service Commission wanted to make a basic change in the way telephone service is provided," the spokeswoman said.

The PSC ruling also provides benefits for users in counties unaffected by the metropolitan-area calling plan. All intralocal access and transport area calls in the state will be reduced between 10% and 20%, depending on the distance of the call. Also, business and residential users will see their basic service rates cut by $2.50 per month. These savings will take effect Jan. 1.

Next year will be the third

(continued on page 12)

WASHINGTON UPDATE

BY ANITA TAFF

GSA awards FTS 2000 support contract. As part of the massive Federal Telecommunications System (FTS) 2000 project, the U.S. General Services Administration last week awarded a $29 million support contract to Centel Federal Services Corp. of Reston, Va.

Under the terms of the agreement, which is known as the Technical Assistance and Management Services (TAMS) contract, Centel will aid in the transition from current federal telecommunications services to the new FTS 2000 network. The FTS 2000 contract is expected to be awarded on Dec. 10.

One major job Centel will handle is the development of a system to verify that FTS 2000 services are being billed properly. Services under the TAMS contract will be provided through Sept. 30, 1989, but the government has the option of renewing the contract for another year beyond that date.

Globenet takes part in RBHC gateway trials. Globenet, a packet-switching carrier based in Alexandria, Va., announced last week that it will provide interexchange services to be used in conjunction with seven gateway trials scheduled by the regional Bell holding companies.

Because the RBHCs are prohibited from offering services across local access and transport areas, an interexchange carrier is needed to provide access to remote information service providers. According to company officials, Globenet already has circuits in place to serve the following scheduled trials: Nynex Corp.'s trials in Boston, New York and Burlington, Vt.; BellSouth Corp.'s trial in Atlanta; Bell Atlantic Corp.'s trials in Philadelphia and Washington, D.C.; and Southwestern Bell Corp.'s trial in Houston.

Extension for comments. The Federal Communica-

(continued on page 12)

MCI VP talks about carrier's directions

David Link lays out the plans that will keep his company moving forward in a cutthroat industry.

In its dogged pursuit of AT&T and with a wary eye on US Sprint Communications Co., MCI Communications Corp. is enriching its long-distance network to deliver advanced voice and data services to its customers.

As network engineering vice-president for MCI, David Link oversees construction, development, management and maintenance of the carrier's network.

Before joining MCI, Link logged one year as a division manager for AT&T and 11 years as a district manager with Southwestern Bell Telephone Co. Link recently discussed the evolution of the MCI network with Network World *Senior Editor Bob Wallace.*

How large is MCI's domestic network?

The network has roughly 42,000 route miles and uses about 100 digital network switches. All traffic is switched digitally. The network is 85% to 90% digital now and will be all-digital in six to 12 months. We no longer lease capacity on AT&T's long-distance network.

> "Using fewer but larger switches makes the MCI network more efficient."
>
> ▲▲▲

Will you eventually retire analog microwave links in the network?

No. We decided some time ago that we will keep our analog radio systems in service after our network is fully digital. They will be used to carry overflow traffic or to carry heavy traffic in the event of a catastrophic network failure.

When will the network be completed?

The network may never be completed. We will expand the network to handle increases in traffic. We will finish building a fiber route that runs from Houston to Los Angeles by the end of this month. It could be our last major network construction project.

From where is the MCI network managed?

We manage and control the entire network from our national network management center in Reston, Va. We also have regional network management sites in California, Texas and Virginia.

David Link

How is the network evolving?

We began installing our first digital network switches in 1983. We use Northern Telecom and Digital Switch [Corp.] switches in our network. The first ones could only support 20,000 to 25,000 ports.

Over the last two years, we have taken 50 of these switches out of the network. In many cases, they were replaced with larger and more modern switches that can support 50,000 to 60,000 ports.

Switches that were not removed were equipped to handle more ports. As a result, the MCI network uses fewer switches than it did just a few years ago. Using fewer but larger switches makes the MCI network more efficient.

What changes in interoffice trunking are in the works?

We're already replacing some high-speed trunks with even faster links. We want to interconnect our network switches with [45M bit/sec] trunks. This is one of the biggest changes we plan to make in the network over the next year.

US Sprint recently said it has completed implementation of Common Channel Signaling System 7 (CCS7) in its network. How has MCI's CCS7 project progressed?

We expect to have Signaling System 7 fully implemented in the MCI network in the first quarter of 1989. One of the greatest advantages we'll realize from

(continued on page 12)

Metro call plan aids Tenn. users

continued from page 11

straight year the PSC has ordered South Central Bell to reduce its rates, and it will be the largest cut by far, the PSC spokeswoman said.

The metropolitan-area calling plan is aimed at helping economic development in Tennessee, the spokeswoman said. "This is one more factor that will help draw companies into our state," she said.

Ted Vagelos, assistant director of telecommunications at Vanderbilt University here, said he is looking forward to large savings and increased communications between the university and surrounding communities as a result of the plan.

One site at which Vanderbilt will realize savings is its medical center, which serves as the main trauma center for central Tennessee. Lower priced calls will cut phone expenses at the medical center, where personnel often call outpatients in surrounding counties for such reasons as confirming appointments.

The plan will also lower calling costs for hospital-bound patients and their families. Furthermore, it will improve business at the medical center by encouraging potential patients and people looking for physician referrals or medical information to call the center, Vagelos said.

At the university, the plan will encourage more phone calls from people in nearby counties who want information about sporting and cultural events on campus.

"This plan will cut [the cost of] intra-LATA, intrastate calls, which have the highest rates for any long-distance calls," Vagelos said. "It eliminates a barrier."

MCI VP talks about carrier's directions

continued from page 11

CCS7 will be quicker call setup. We'll also use CCS7 to deliver new calling services.

[Link did not discuss new services made possible by CCS7, but an MCI spokesman confirmed that the company plans to roll out a service similar to AT&T's INformation FOrwarding-2 feature, which is supported by AT&T's Primary Rate Interface service. The MCI service will provide information such as the telephone number of the calling party.]

What steps is MCI taking to speed service provisioning?

We're fully automating the new-service order-entry process for dedicated services. From the time an order for private-line service is entered to the time the service is provisioned, orders will be untouched by human hands.

This will enable us to reduce the amount of time an MCI customer must wait for service. Today, it generally takes [interexchange carriers] about 30 workdays to provision service. Some carriers take a little longer; some take a little less.

We'll be able to provision a private line as quickly as the local operating company can provide local access, which is roughly two weeks.

How does MCI handle T-1 circuit degradation and failures?

Under the current system, we usually have to wait until the customer tells us that his line is out of service before we can respond. But we're in a state of transition.

We have [extended superframe format] in some parts of the MCI network today. We're putting in ESF with all new T-1 lines. It will be deployed throughout the network by the end of next year.

ESF will allow us to monitor T-1 performance in real time. With ESF, we can spot circuit degradation and take steps to keep the line from going down. We can catch service degradation before the customer notices any change in line quality.

> With ESF, we can spot degradation and take steps to keep the line from going down.

▲▲▲

How is MCI's network set up to handle a large outage, such as the one that occurred recently when a construction crew at work in a rail yard cut a high-speed AT&T fiber-optic link, shutting down numerous companies' voice and data networks?

The fiber we run alongside railroad tracks is located as far away from the railroad bed as possible and is buried a minimum of four feet.

We have enough emergency backup facilities to carry all MCI traffic in the event of a [major] cable cut. We would not have to block any calls in that type of situation.

[MCI] doesn't need to have matching facilities for its switched network because traffic can be routed over alternate paths in the event of a cable cut.

Washington Update

continued from page 11

tions Commission last week consented to two more weeks for comments on its proposed rules allowing telephone companies to purchase cable television companies. The comments, initially due by Dec. 1, can now be filed until Dec. 16.

The additional time was requested by the Community Antenna Television Association, which said more time was needed to consider the critical issues raised in a statement issued last month by FCC Commissioner Patricia Diaz Dennis.

Diaz Dennis identified a number of concerns about the FCC plan, including whether telephone companies should be allowed to purchase cable operations in their own service areas and whether they should be allowed to provide program content.

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

> "We see fiber or satellite just like anything else: as another media to be used appropriately, consistent with its attributes."
>
> **Bill Hider**
> Vice-president of
> telecommunications
> Gannett Co., Inc.
> Arlington, Va.

Data Packets

Micom Communications Corp. announced last week what it claims is the first three-year warranty in the data communications industry.

The company previously offered customers a one-year repair warranty for its product line, which includes statistical multiplexers and data switches. The old warranty also provided three months of emergency service for next-day replacement of failed products.

The new warranty extends emergency replacement coverage to 12 months. Micom pays all factory repairs and outgoing freight charges. Free factory repair, without emergency replacement or payment of freight charges, is extended from one to three years.

Customers can purchase a separate Warranty Plus+ to extend emergency replacement protection for the second and third years of the warranty period. The cost of this option depends on the equipment covered.

The new warranty covers all Micom products purchased after Oct. 1. The Warranty Plus+ agreement is also available at a reduced rate for products purchased before that date but within the past 12 months, according to the announcement. The three-year warranty is made possible by a program Micom initiated 18 months ago to improve product quality, said Gil Cabral, Micom president. Micom is located at 4100 Los Angeles Ave., Simi Valley, Calif. 93062, or call (800) 642-6687. ◼

Railroad group develops train monitoring standard

By Paul Desmond
Staff Writer

A group of North American railroads has nearly completed a standard for train monitoring and control systems that, if implemented industrywide, will enable companies to track their trains even when using a competitor's track.

The Advanced Train Control System (ATCS) standard promises to increase railroad productivity by providing better scheduling and increased fuel efficiency. It will also help analyze locomotive performance to minimize locomotive failures.

Defining standards promises to keep the price of system components down by fostering competition among suppliers, as opposed to each railroad opting for a proprietary control system.

Vendor and user interest

More than 50 vendors and 14 railroads have been involved in the ATCS project over the last five years, said Peter Detmold, executive director of ATCS, which is cosponsored by the Association of American Railroads and the Railway Association of Canada.

The group has drafted 19 specifications that collectively compose ATCS. At the end of the last ATCS meeting in October, all but three of the 19 specifications had been approved and sent to vendors for designing and manufacturing the components, Detmold said.

Each specification covers a different aspect of the control system, from communications system architecture to message formats to the locomotive computer system.

Braking algorithm

One of the specifications involves a braking algorithm that enables an on-board computer to stop a train upon command from a remote dispatcher. The two others deal with software quality assurance and environmental requirements, which define variables such as permissible temperature ranges.

Detmold said he expects the braking algorithm to be complete by January, although the other two specifications may take longer.

The specifications do not refer to manufacturing details but to basic functions and interfacing requirements such as connectors, frequencies and voltages. The in-

(continued on page 49)

DEC offers file servers for big workstation nets

By John Cox
Senior Editor

MAYNARD, Mass. — Digital Equipment Corp. last week unveiled a new family of file servers for customers with networked workstations running different operating systems.

The new VAX Fileserver 6200 series extends file services to workstations running VAX/VMS, Unix, Ultrix (DEC's version of Unix) and MS-DOS. Based on the newest multiprocessor midrange VAX computers, the file servers are designed to supply workstation networks with high performance I/O and disk capacity, according to the company.

The Fileserver 6200 line supports up to 40G bytes of local storage. When configured in a DEC VAXcluster arrangement, the servers offer up to 600G bytes of storage. Each server supports up to four Ethernet controllers.

DEC offers the servers with either the VAX/VMS or Ultrix operating system. In both cases, users can choose a single- or dual-processor model. The VMS models support VMS, Ultrix, and other Unix and MS-DOS workstations, while the Ultrix models support Unix devices.

DEC's VMS Services for MS-DOS enables IBM Personal Computers and compatibles to access VMS-based file services.

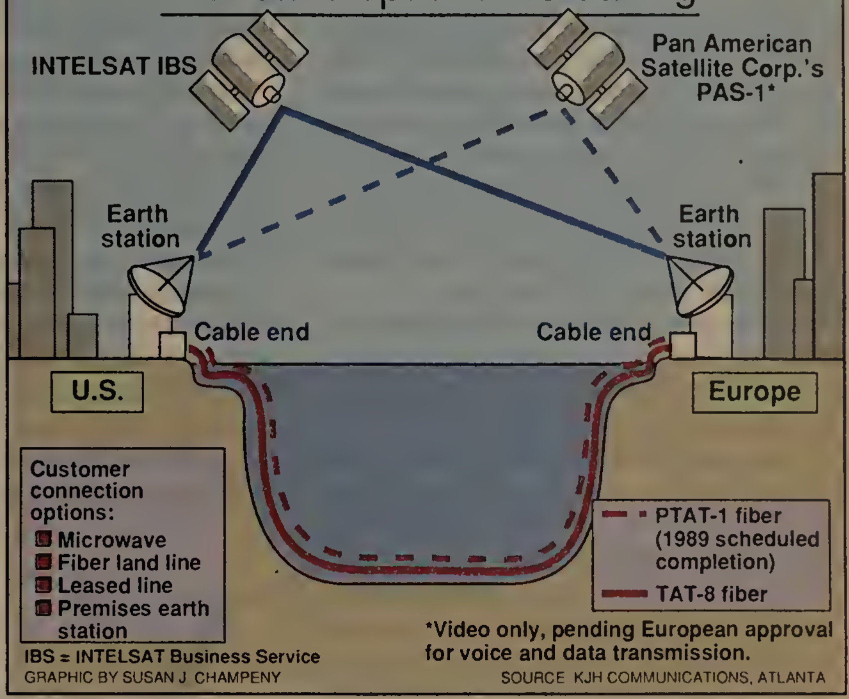
The VMS-based server comes with a software license for centralized file management and software to provide file services to Ultrix and Unix devices via the Network File System (NFS) protocol. The server is also equipped with DEC's Network Management Control/Ethernet Network Integrity Monitor, an expert system-based software package for managing large networks.

The Fileserver 6210 costs $269,800, and the 6220 costs $370,900.

The Ultrix-based Fileserver 6200 models support DEC's Ultrix workstations and other Unix workstations. The server supports both NFS and Transmission Control Protocol/Internet Protocol. Another software package enables the servers to communicate with DECnet nets.

The 6210 Ultrix model is priced at $233,000. The 6220 costs $329,500. ◼

Wideband options increasing



*Video only, pending European approval for voice and data transmission.

IBS = INTELSAT Business Service

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: KJH COMMUNICATIONS, ATLANTA

Wideband options open up with TAT-8

Transatlantic fiber cable promises new pricing, access options as well as alternative to satellite.

By John Cox
Senior Editor

ATLANTA — Something new will soon be available in transatlantic wideband digital communications: a choice.

The TAT-8 undersea cable, the first fiber-optic link to Europe, may be cut over as early as mid-December. It will give corporate users an alternative to satellite transmission as well as new pricing and access options from at least one TAT-8 carrier, AT&T, the largest shareholder in the cable project.

The TAT-8 project highlights a number of important trends in the international wideband transmission market, according to Kathleen Hansell, president of KJH Communications, an Atlanta-based market research firm and author of a recent study on wideband options in the Atlantic region.

The transatlantic transmission market is characterized by rapidly increasing digital bandwidth, multiple carriers, multiple transmission options, stabilizing rates, simpler and less expensive customer access to transmission facilities and growing competition among European public carriers for U.S. business.

More options, discounts

Hansell said telecommunications managers can expect carriers to offer packages of wideband digital services at volume discounts.

Such offerings will make it easier and more economical for managers to build networks that employ multiple transmission media, she said.

TAT-8 will merely fuel, not satisfy, the corporate hunger for digital bandwidth, Hansell predicted.

With a total capacity of 560M bit/sec, TAT-8 will dwarf existing undersea coaxial cables, which handle mainly voice traffic.

Hansell said some observers predicted that the premier international digital satellite service, the International Telecommunications Satellite Organization's INTELSAT Business Service (IBS), would experience slower growth in 1988 as customers waited for TAT-8 to come on-line. In fact, she said, IBS doubled its growth this year, just as it has done for the past several years.

But the fiber does herald an alternative to IBS. Fiber will be attractive for voice applications because it will eliminate the delay associated with satellite transmission and reduce interference caused by bad weather.

Satellite links will remain attractive because access to the international gateway is often simpler and less expensive than terrestial access to the cable end, Hansell said.

Users with critical applications may consider using fiber links as backups to satellite or vice versa.

Competition among U.S. carriers is likely to intensify as they vie for international voice and data business, Hansell said.

IBS, for example, spawned new carriers that were devoted to fast, all-digital service offerings. By the end of 1987, there were 25 carriers offering IBS service, she said.

Similarly, in the TAT-8 project, there are a host of carriers

(continued on page 14)

Wideband options open up with TAT-8

continued from page 13

besides AT&T that own the cable. And still other carriers are installing new fiber routes.

AT&T already has announced its intention to exploit the new facilities. Last month, the company announced a range of new high-speed digital services, more access points and a revised pricing plan for its international digital services. The services will be offered over a combination of satellite, undersea coaxial cable and, when operational, the TAT-8 fiber cable.

The cable will enable AT&T, for the first time, to offer as an international service its Accunet family of high-speed services, according to an AT&T spokesman.

The range of transmission and carrier options will increase even more within the next year, Hansell said. Pan American Satellite Corp.'s PAS-1 satellite is now transmitting video signals between Europe and the U.S. The company is seeking approval from European carriers to begin transmitting voice and data as well. Most observers expect approval to be granted eventually, she said.

PTAT-1 to be ready next year

Sometime next year, another fiber cable, PTAT-1, is expected to be completed. This project, a joint venture of Cable and Wireless PLC of the UK and Private Trans-Atlantic Telecommunications System, Inc., will add 1.24G bit/sec of new capacity, with channel speeds ranging from 64K bit/sec to 140M bit/sec, according to Hansell.

Key trends in wideband digital services

- Soaring wideband capacity
- Multiple carriers, both public and private
- Many transmission options
- Rate stabilization
- Simpler, more economical wideband access
- Increased competition among public European carriers

GRAPHIC BY SUSAN SLATER

Despite the surge in capacity and new service offerings, Hansell said she expects service rates to stabilize. Rates in both the U.S. and Europe may dip slightly lower in the future but not by as much as they have in the past.

But others say there is room for rates to fall even lower. "My feeling is that once this [fiber] bandwidth becomes available . . . international satellite facilities will decrease dramatically as far as costs go," said Ronald Meyers, vice-president of global networks for Bankers Trust Co. of New York.

Access to international facilities is becoming easier and more economical, Hansell noted. This is especially evident in Ku-band satellite services, which use earth stations that are smaller and less expensive than those used with C-band satellite systems.

Ku-band stations can be close to or even at customer sites, so the cost of accessing them by leased lines is reduced.

AT&T, for its part, plans to boost its international access points from five to 25 cities to make it easier to use international digital service.

Hansell said the European post, telegraph and telephone administrations, spurred by the scheduled abolition of European trade barriers in the Common Market in 1992, are also warming up to the idea of offering a wider breadth of services. European transmission rates have fallen 34% in the last year.

The Netherlands' PTT Telecommunicatie will go private on Jan. 1 to compete more effectively in the new environment. And West Germany's Deutsche Bundesposte has been running advertisements in U.S. business publications promoting a new image of the PTT as a flexible, easy-to-work-with service provider, Hansell said.

These trends are creating choices that offer new challenges and opportunities for communications managers.

One of the first users of the TAT-8 fiber cable will be Bankers Trust. Currently, the global financial services firm relies on multiple satellite links up to 256K bit/sec to support its X.25-based global backbone, said Bankers Trust's Meyers. Much of that traffic will be shifted to TAT-8 to achieve an all-digital connection and higher reliability, he said. Another reason is to cut the satellite delay for voice and interactive terminal traffic.

The increased fiber bandwidth and anticipated lower costs will enable Bankers Trust to reconsider the use of video teleconferencing, an application previously dismissed as being too expensive to implement, Meyers said.

But other users are either satisfied with their satellite links or are looking at how to combine satellite and fiber links.

USA Today, a subsidiary of Gannett Co., Inc., employs two separate satellite connections to the Swiss firm that prints its European edition, according to Bill Hider, vice-president of telecommunications for Gannett. A one-way, 128K bit/sec satellite link transmits the pages while a separate two-way, 64K bit/sec link handles a combination of voice, testing and control signals.

No plans for TAT-8

Hider does not plan to jump to TAT-8. For one thing, he said, satellites have proven to be more available, if no more or less reliable, than cables. "They're not subject to technicians tinkering with them or people tripping over cables in a central office. Or backhoes," he said.

Gannett will consider using the fiber cable as a backup transmission path to the satellite. One significant variable would be the cost of the land line from the cable end to the Swiss printing plant, Hider said. ☑

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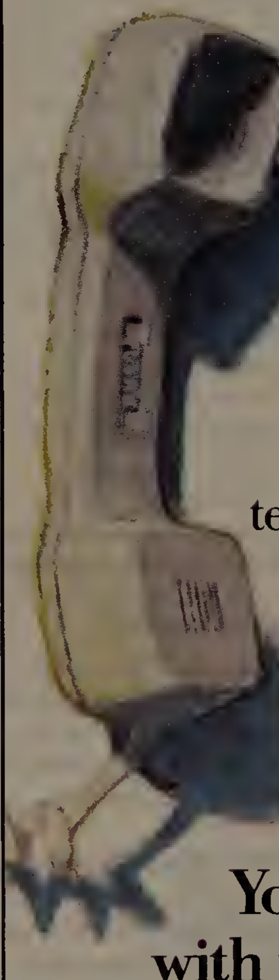

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Bogged down by IBM X.25 link, Bekins shifts gears and vendors

By John Cox
Senior Editor

GLENDALE, Calif. — The Bekins Co. was set earlier this year to test a major enhancement to the application software that is its lifeblood when it found a bottleneck in its wide-area network package.

The transportation company had been running IBM's NCP Packet Switch Interface (NPSI) software on an IBM 3725 Model 1 communications processor as the interface between Systems Network Architecture mainframes and the packet-switched network used to support remote workstations.

Independent moving agents use microcomputers with software developed by Bekins to dial up the public packet network and, via NPSI, access information on Bekins' data bases that is vital to planning profitable moving jobs.

When Bekins began testing an improved version of the microcomputer package that had new features and was easier to use, it found NPSI was being overwhelmed by the larger files generated.

After going to some lengths to try to accommodate the new requirements using NPSI, the company decided the only answer was to replace the software with a competitive product. It chose Network Access Support (NAS) from Comm-Pro Associates, Inc. of Redondo Beach, Calif.

The Bekins name appears on moving trucks across the country, but the company, based here, actually owns few trucks. Bekins is, in effect, an information intermediary, according to Pedro Bernardy, Bekins' technical services manager.

Information about residential and commercial moves, along with complex routing and pricing data, is compiled and maintained by some 500 Bekins employees. These employees comprise a liaison group with the independent moving agents.

Based in Chicago, this group uses 3270 terminals to access the data base located here, at the site of the corporate IBM 3090-150 mainframe. The machine runs the MVS/XA operating system and IBM's Information Management System (IMS), an on-line transaction-processing package.

Independent agents across the U.S. log onto the data center via the McDonnell Douglas Network Systems Co.'s Tymnet public packet-switched network using Bekins Communication (Becom) software. Through Becom, the agents collect information on routes and prices, register jobs with Bekins and notify other agents who might be involved with a move at different times and locations, said Chuck Bostwick, Bekins' director of computing and communications services.

For years, Bekins relied on IBM's NPSI to enable the agents to create an SNA session over Tymnet. "NPSI worked fine for us," Bernardy said.

But NPSI couldn't handle the larger files generated by the new version of Becom. "NPSI couldn't break it down to the right size pieces to feed it to IMS and VTAM," Bostwick said.

One of the functions added to Becom that increased file size was an interactive rating system that lets agents calculate how revenue from a given move would be parceled out to the various parties involved in the job. "The rating system lets them see what their cut is if they book with us," he said. "That's important for these agents, many of whom are small businessmen with revenues under $250,000 a year."

The NAS software costs the same in monthly fees as NPSI.

▲▲▲

Working with IBM, the technical staff tried changing network parameters, such as the size of the buffers, in an effort to accommodate the larger microcomputer files. The changes either did not solve the problem or created new problems.

The technicians also considered using a hardware protocol converter to eliminate the need for NPSI. But that option was ruled out as too costly. "We were kind of between a rock and a hard place," Bostwick said. "We had to make a decision fast, within a matter of weeks."

Bekins finally settled on NAS as an NPSI alternative. "You don't tie up the front-end buffers," said Steve DuBow, a principal of Comm-Pro Associates. "You give it to the host as you receive it so there are no delays. And secondly, the host can write what [it's] receiving to disk so you're not tying up memory in the front end or the host."

Although NAS offered this dynamic buffering, the software had not been designed to manipulate large files. Comm-Pro Associates made the needed changes in the software for Bekins and later incorporated the changes into its standard version of the product, DuBow said.

Bostwick said the NAS software costs the same in monthly licensing fees as NPSI, an important consideration because NAS didn't require an additional capital outlay. There have been no performance problems, he added.

IBM last September released a new version of NPSI. Bostwick said he doesn't know whether the improvements in the new version would have solved the specific problem Bekins faced. He said it was unlikely he'd return to NPSI in any case, unless IBM were to integrate NPSI with the front-end-based Network Control Program software. "That might be a compelling reason to go back to it," he said. ☒

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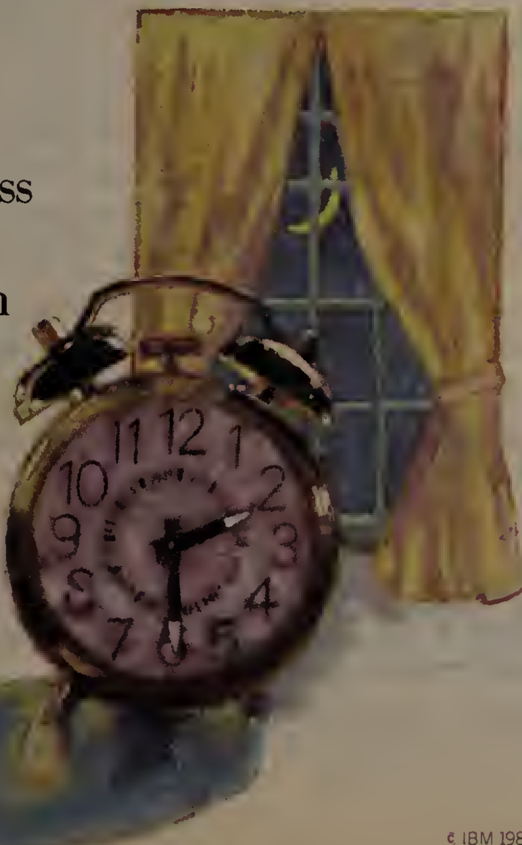

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Worth Noting

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>
> **Paul Nelson**
> Data communications
> and network analyst
> Venture Development Corp.
> Natick, Mass.

Netnotes

Kinetics, Inc., a division of Excelan, Inc. that specializes in networking products for the Apple Computer, Inc. Macintosh market, recently announced a program for users who want to upgrade to FastPath 4, the latest version of the company's Ethernet-to-LocalTalk gateway.

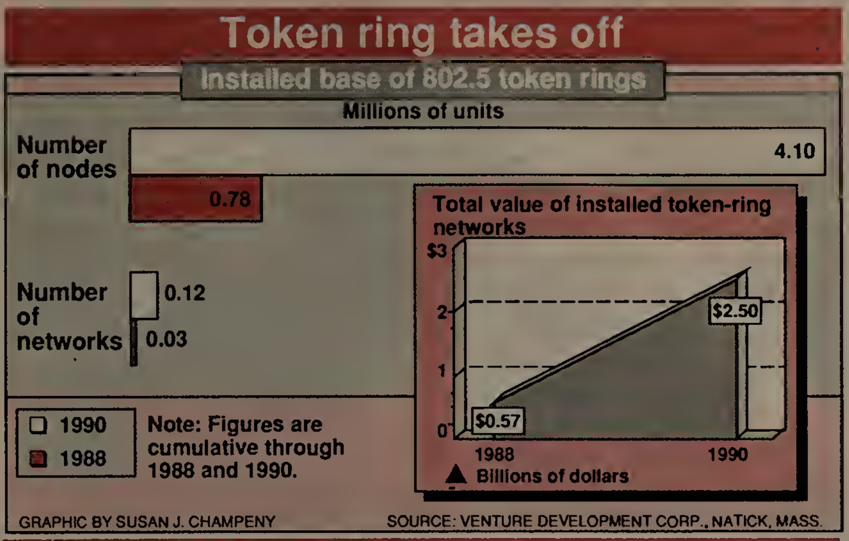
The FastPath 4 gateway, introduced in July, lets users connect 230K bit/sec LocalTalk networks to 10M bit/sec Ethernets. It features 256K bytes of random-access memory, while earlier versions of FastPath had only 48K bytes of memory, according to Tom Cromelin, Kinetics product marketing manager.

Users who bought the three earlier releases of the FastPath gateway can upgrade to FastPath 4 in one of three ways.

They can trade in any of the prior versions of the gateway and receive $1,000 credit toward the FastPath 4's list price of $2,495. Or they can take advantage of the Kinetics Swap Program or the Return-Rework Program and receive upgrades to their current gateways that offer some features of FastPath 4.

Upgraded FastPath 2 and 3 gateways will have a maximum memory of 80K bytes.

The FastPath 4 upgrade programs are available now. Users wishing to enroll in any of the programs can contact the Kinetics sales department at either (800) 433-4608 or (415) 947-0998. ◘



Token ring takes off

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: VENTURE DEVELOPMENT CORP., NATICK, MASS.

TI readies 16M token-ring chipset for market debut

3Com, Proteon, others to embrace TI offering.

By Laura DiDio
Senior Editor

DALLAS — Texas Instruments, Inc. is expected to announce tomorrow its 16M bit/sec token-ring chipset, which will enable local network vendors to build IBM-compatible 16M bit/sec token-ring products.

Without waiting for TI's formal announcement, some 16 network vendors — including 3Com Corp., Proteon, Inc., SynOptics Communications, Inc., Network General Corp. and Interlan, Inc. — have already said they will use the chipset. To date, TI is the only semiconductor manufacturer committed to producing the 16M bit/sec chip for the commercial market.

> The TI chipset supports up to 260 active stations on a single 16M bit/sec ring.
>
> ▲▲▲

TI's 16M bit/sec token-ring device is a two-chip chipset featuring full compatibility with IBM's 16M bit/sec Token-Ring product family as well as with the IEEE 802.2 and 802.5 standards.

It consists of a communications network processor chip, which performs protocol processing, buffering and transfer functions, and a ring-interface chip, which is the interface to the token-ring wiring media, according to Leon Adams, the company's open systems marketing manager.

Unlike the single proprietary IBM 16M bit/sec Token-Ring chip, the TI chipset will not initially enable users to switch between 4M and 16M bit/sec network operation. Adams said, however, the company will offer this option in the future.

Like the IBM offering, the TI chipset supports up to 260 active stations on a single 16M bit/sec ring. It also supports the Early Token release option, which increases network efficiency and reduces transmission delay.

The main chip in the chipset, the TMS380C16 token-ring CommProcessor, replaces the five older chips used in the company's 4M bit/sec product.

Reducing the number of chips and providing 32-bit addressing will allow vendors such as 3Com and Proteon to support up to 2M bytes of random-access memory on their network adapters, Adams said.

The 2M bytes of RAM is 32 times the amount of maximum memory available on IBM's new 16M bit/sec interface, called the Token-Ring Network 16/4 Adapter. The IBM adapter features a maximum of 64K bytes of RAM, up from the 8K or 16K bytes of RAM used with the 4M bit/sec Token-Ring Adapter.

The memory boost for both products makes it possible to support larger data frames containing up to 18K bytes. The older 4M bit/sec token-ring chipset limited frames to 2,000 bytes. Adams said increased frame size can improve transmission efficiency and throughput by as much as 300% in some applications.

While most users do not need the maximum 2M bytes of memory possible with TI's chipset, the ability to support that much memory will be a necessity for high-performance file servers.

In the future, portions of the 2M bytes of memory will also be allocated to execute downloadable network protocols such as Transmission Control Protocol/Internet Protocol. Network protocols are currently executed on the host processor, but Adams

(continued on page 18)

Proteon fixes flaw in token-ring LAN

Vendor repairs design defect in Media Access Units for its 4M bit/sec token-ring networks.

By Laura DiDio
Senior Editor

WESTBOROUGH, Mass. — A design glitch that rendered Proteon, Inc.'s 4M bit/sec token-ring Media Access Units (MAU) inoperative in certain circumstances has been identified and fixed, according to Proteon President Patrick Courtin.

The problem, which affected the operation of only a small percentage of the Model 2710 MAUs, first came to the company's attention about two months ago, Courtin said. But because the MAUs failed only in a limited number of instances, it took Proteon several weeks to determine the cause of the failures.

The Proteon 2710 MAU is a hardware device used as a hub in star-wired, twisted-pair, token-ring networks. It supports up to eight individual wire connections to personal computers or peripherals and a link to other MAUs or a token-ring backbone.

"It was instant mortality," said a network integrator who requested anonymity. He had problems with the 2710s he was installing at a large campus site. "We never even got the network up and running, which meant it never really impacted the user." He said he eventually had to return 70% of the 2710s.

"It's a very strange sort of problem that only occurs when certain conditions are present," Courtin said. Specifically, the Model 2710 4M bit/sec token-ring MAU was failing when used with IBM Personal Computer clones containing an IBM network interface adapter and when there were more than six machines on the net, Courtin said.

"Basically, when all of these factors are present, it changes the power balance on the MAU. The result is an open condition — the switch on the MAU opens up but the token is not taken and transmitted over the network," Courtin said.

And because the user is denied access to the token ring, the net-

(continued on page 18)

Vaccine buyers: Beware of questionable antidotes

By Paul Desmond
Staff Writer

Users should be wary of some so-called vaccine products that claim to defend against computer viruses because few perform as promised and others can disrupt programs or destroy data, according to industry experts.

Concern over the threat of viruses has heightened in the wake of the most widely publicized attack to date, the invasion of the Internet nationwide research network by a virus program that disrupted operations at sites across the country. Many users, particularly those with large networks over which viruses can quickly spread, are now looking for ways to protect their information systems.

Realizing this, some vendors are trying to turn a quick profit by capitalizing on the fear the viruses have created, analysts said. These firms offer vaccines that often are not thoroughly tested and can actually do more harm than good, both by giving users a false sense of security and by damaging data or rendering computers inoperable.

Jon David, a security consultant based in Tappan, N.Y., recently completed a study of 20 commercially available antiviral products. The study was commissioned by the publishers of *Computers & Security*, the professional journal of the International Federation for Information Processing (IFIP) Technical Committee 11 on Computer Security. IFIP is comprised of computer societies from about 60 countries.

In the study, products were tested both in a laboratory environment and in actual field applications with the cooperation of some 40 evaluation sites worldwide. The study findings will not be published until early next year.

But David told *Network World* he determined that some products will work only on certain brands of computers running certain applications. When run with incompatible hardware or software, some vaccines never get the chance to detect a virus because the vaccine renders the computer inoperable.

One product, which he declined to name, wiped out all the

(continued on page 25)

Proteon fixes flaw in LAN

continued from page 17

work goes into diagnostic mode and tries to resolve the problem. This cannot be accomplished, however, because there is an open port, Courtin explained.

"We started hearing from customers two months ago that the 2710 MAUs weren't working, but when the units were sent back to us, they worked perfectly on Proteon's in-house systems," Courtin said. "We were puzzled because we've shipped over 20,000 of the 2710 4M bit/sec token-ring MAUs, and the problem has occurred in fewer than 100 of the devices."

Systems integrators and retailers contacted by *Network World* agreed with Courtin's assessment.

"We've heard about the problem, but it hasn't occurred in any of the 300 or 400 Proteon MAUs that we've sold and installed," said Peter Kraus, vice-president of LAN Services, Inc., a systems integrator and retailer in New York that sells the Proteon product line.

"The design glitch usually only occurs when the Proteon MAUs are used in conjunction with low-end PC clones," he said.

"The problem really started," he said, "when IBM redesigned its 4M bit/sec Token-Ring Adapter 2 boards for PCs, featuring more memory and added functions. The new IBM adapter boards seemed to bring out the problem with the Proteon MAUs."

When LAN Services and other systems integrators and retailers contacted Proteon for more information about the problem, Proteon gave them the serial numbers of the affected MAUs.

Proteon sent engineers equipped with network probes and analyzers to two user sites in an attempt to duplicate the failure conditions. Once the problem was determined, the engineers were able to redesign the device by adding an additional capacitor to the MAU.

While customers found the situation annoying, they also said they were pleased with Proteon's responsiveness. "We contacted Proteon, and we had new MAUs with the engineering fix on them within 24 hours," the unnamed network integrator said. "A lot of other vendors we work with don't respond nearly as well, which is one of the reasons we stick with Proteon."

A Proteon user on the East Coast who asked not to be identified reported a similar experience. Proteon was "very helpful, responsive and forthcoming about the problem with the 2710 MAU. We had no trouble getting replacement units within a day."

The users also said this was an isolated incident and that the quality of Proteon's products has generally been very good of late.

"Without hesitation, I would say that Proteon's token-ring products are well engineered, and they have an excellent handle on network management," the network integrator said.

Courtin said that, while the engineering fix has been implemented on the Model 2710, a few users with the original units may still encounter the problem.

Any users that think they are experiencing this problem should contact Proteon's customer service department at (508) 898-3100. The company will exchange the original 2710 model for another once it has verified the problem exists, Courtin said. ◻

TI readies 16M chipset for debut

continued from page 17

said that TI expects to have products that execute network protocols directly on the token-ring COMMprocessor by late 1989.

The TMS380C16 dedicated 16-bit CPU executes the IEEE 802.5 Media Access Control protocols and the IEEE 802.2 Logical Link Control protocols. The CPU processes up to four million instructions per second and adds a register cache to support the higher speed net throughput.

The second chip in the chipset, the TMS38053 ring-interface, is specifically designed to work with the TMS380C16 CommProcessor. It provides all of the logic required to implement the physical connection to the token-ring wiring.

The two chips in the TI 16M bit/sec token-ring chipset are sold separately. In 1,000-piece quantities, the TMS380C16 CommProcessor is priced at $96. The TMS38053 ring-interface sells for $24 in the same quantities. The TI chipset has been beta-tested for the past several months. Volume production is slated for mid-1989. ◻

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NETWORK WORLD

NETWORK MANAGEMENT IN THE MULTI-VENDOR ENVIRONMENT

Moderator: Bruce Hoard, *NetworkWorld*
Dan Richards • Howard Frank • David Edison
James Herman • William Gilbert • Peter Hicks

January 20, 1989
11:30am–4:00pm, EST

● Benefits

Can you answer these questions?

- What are the different kinds of network management?
- How big a network must you have to employ network management?
- How effective are modems as network managment tools?
- Does IBM control the market and dictate network management standards with Netview and Netview PC?
- Does the International Standards Organization Open Systems Interconnect (OSI) model offer an alternative to Netview and Netview PC?
- How do users view AT&T's Universal Network Management Architecture (UNMA)?
- How many third-party network management companies exist and what kind of products do they offer?
- How much network management capability is built into the various long-haul carrier services?
- How can you cost justify network managment purchases?
- What's the difference between performance measurement and diagnostics?
- What is the Network Management Forum?

● Purpose

The purpose of this seminar is to familiarize participants with both basic and advanced elements of network management hardware, software and services. It is further the purpose to show, through actual user experiences, how network management tools can create more cost efficient networks.

Network management for both large and small networks will be addressed. The role of modems in multi-drop networks will be discussed along with the network management capabilities of T-1 multiplexers.

Products and services from both large and small vendors will also be discussed, as the panel attempts to cover the widest possible spectrum of offerings.

Issues of interest will vary widely. This seminar will be of equal value to data oriented computer system departments and voice oriented telecommunications departments.

● Audience

This seminar is designed for all technical managers, engineers and technical staff responsible for corporate telecommunications and data communications, whether it be in the MIS or communications departments.

Syllabus

IBM
- IBM Strengths and Weaknesses of Netview and Netview PC
- Network Management for OS/2 Users Netview versus OSI Network Management
- Netview versus AT&T and DEC Network Management within SAA Alliance with PacTel Spectrum

Digital Equipment Corporation
- Enterprise Management Architecture (EMA)
- EMA Compatibility with OSI Configuration Management Information Protocol (CMIP)
- Third Party Vendors under EMA Umbrella

AT&T
- Strengths and Weaknesses of UNMA
- Monitoring 400 PBXs Simultaneously with Accumaster

Hewlett Packard
- OpenView

Modem-Based Network Management
- The Necessity to Differentiate Commodity Products
- Proprietary versus Open Systems
  - — Racal Milgo Codex
  - — Atlantic Research
  - — AT&T Case Digilog
  - — Dynatech Infinet Paradyne
  - — General DataComm

T-1 Multiplexer Network Management
- Timeplex
- Network Equipment Technologies
- Stratacom

Private Packet Switching Network Management
- BBN Telenet Memotec

Dan Richards

Dan Richards is IBM's manager of network management products, including Netview and Netview PC. Since starting at IBM in 1959, he has held a variety of positions, including senior system engineer, network control products development and test manager and network control products product manager.

Howard Frank

Howard Frank is chairman of Network Management, Inc. Past president and CEO of Contel Information Systems, he has served as visiting consultant in charge of network analysis for the Executive Office of the President of the United States.

David Edison

David Edison is executive vice president of Corporate Information and Communications Systems, Westinghouse Electric Corp. He has responsibility for planning and operating the corporate telecommunications network, a $60 million enterprise. He started at Westinghouse in 1963.

James Herman

James Herman is president of Future Network Consulting. In over 14 years of computer and communication system experience, he has managed some of the world's most complex networks, including the ARPANET, the Defense Data Network and the DARPA Internet.

William Gilbert

William Gilbert is responsible for planning AT&T's Integrated Network Management program. He works closely with Universal Network Management Architecture and the Network Management Protocol, AT&T's Open Systems Interconnect network management protocols.

Peter Hicks

Peter Hicks is senior director, Network Design, Planning and Implementation with Sears Communications Network, Inc. He has 18 years of experience in the telecommunications industry. He was manager of Network Systems for Standard Oil of Indiana from 1980 to 1985.

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Worth Noting

The Graduate School of Management at the University of Dallas will offer a new program in telecommunications management in the spring semester of 1989. The six-class program will be geared toward managers in medium-sized to large businesses.

Dialogue

Electronic data interchange (EDI) has been touted as a strategic weapon that gives companies an advantage. Do you agree, or do you think EDI has become a competitive necessity?

“We see EDI as a value-added service for our customers. EDI has enhanced our image as a leading-edge supplier and has improved our effectiveness with our accounts. Competition is forcing businesses to use EDI because the major customers are beginning to demand the service.

“EDI is costly for us. As a computer ordering system, it is hard to see how EDI pays for itself. However, in the long term, it will enable us to transmit invoices and transfer funds electronically, and reduce our delivery time to customers. Right now, it seems that EDI benefits the customers more than us.”

W. Scott Roberts
Vice-president of
business relations
Gillette Co., Inc.
Boston

“We entered the whole electronic data interchange arena to gain a competitive advantage, and it has worked. EDI enables us to stock our shelves with fast-selling merchandise quicker than our competition can.

However, I believe EDI is quickly becoming a necessary cost of doing business.”

William Johnson
Corporate director
of telecommunications
F.W. Woolworth Co.
New York

ICA's Robert Bennis testifies before the House of Representatives Subcommittee on Telecommunications and Finance on July 27.

Retirement of ICA policy director marks end of era

By Barton Crockett
Senior Writer

Robert Bennis' greatest professional achievement may have come during a 1976 meeting of the International Communications Association's (ICA) board of directors.

At the meeting, Bennis, who will retire as the ICA's director of public policy in January, made an impassioned plea for the users group to change its bylaws and begin lobbying telecommunications regulators and policymakers on issues of concern to users.

Until then, the ICA had refused to undertake lobbying efforts. The group did not want to upset large vendors by supporting policy measures the vendors opposed.

Bennis, who was a communications manager with Westinghouse Electric Corp. at the time, opposed that policy. After his speech, which witnesses described as charismatic and forceful, the board voted unanimously to endorse Bennis' idea. The ICA created a telecommunications public policy committee and appointed Bennis chairman.

Bennis held this post until 1986, when he became the committee's full-time director of public policy. That year, he retired after 38 years with Westinghouse.

In his public policy positions with the ICA, Bennis has been involved in nearly every lobbying effort undertaken by the group over the past 12 years. As the ICA's premier user advocate, he has made an indelible mark on the regulatory scene in Washington, D.C.

Bennis, who recently turned 67, reflected on his efforts in an interview with *Network World.*

“I'd say my biggest accomplishment, and that of the whole public policy committee really, has been to create a responsible image of the ICA in Washington,” he said. “Before this committee was formed, you'd tell people you were with the ICA and they'd ask you how to spell it.”

Bennis said one of his most important responsibilities in Washington is lobbying regulators for more equitable treatment of business users. In pursuit of this goal, he championed such causes as reduced special access tariffs for private nets and increased competition in the communications services market.

Bennis said his biggest failure during his tenure with the ICA public policy committee was not improving the committee's working relationship with the regional Bell holding companies.

“When you get down to it, users and the RBHCs really have several common interests,” he said. “Yet we haven't built up a very good working relationship.”

The two most important issues facing users in the future, according to Bennis, are protecting private networks from increased tariffs and helping corporations deal with the problems of international networking.

“There is a definite effort to migrate users from private to switched networks,” he said. “The carriers do this by trying to increase such things as special access tariffs. Yet with current technology, there is no way switched networks can solve all of the problems facing business users.”

Bennis added that an abundance of fiber-optic capacity will spur users to expand their networks internationally. “I think the user community is looking eagerly toward the proliferation of worldwide fiber cable,” he said. “It's going to be a bonanza for multinational users.”

Taking over Bennis' post is William Pomeroy, currently president of the ICA.

Diversity aids users in disaster survival

Users look to alternative carriers and multiple network routes for salvation during disasters.

By Wayne Eckerson
Staff Writer

A recent cut in a major AT&T fiber-optic route has heightened awareness among users of the vulnerability of fiber lines and reinforced their commitment to diversifying networks by using multiple carriers.

The issue of contingency planning moved back into the spotlight when damage to an AT&T fiber line three weeks ago knocked out business and residential service from Boston to Atlanta for 16 hours (“Crippled by outage, users reevaluate AT&T service,” *NW,* Nov. 28). The 1.8G bit/sec intracoastal line was severed by a railroad construction crew digging in a northern New Jersey rail yard.

The incident — along with several other recent cable cuts and the well-publicized fire in an Illinois Bell Telephone Co. central office in May — have prompted managers to take steps to protect networks against a variety of potential failures.

“Large users and carriers are selecting multiple carriers and diversifying their routing patterns to protect themselves from possible points of failure,” said Gerald Mayfield, president of DMW Enterprises, a consulting firm in Stamford, Conn.

“Recent events are making users more sophisticated,” he said. “They take nothing for granted. They are now requesting layout plans from carriers to track the path of their circuits to ensure they have backup routing.”

Jim Bruggeman, director of planning and administration for Dun & Bradstreet, Inc. in Murray Hill, N.J., learned the hard way the importance of using multiple carriers. A Dun & Bradstreet office in South Bend, Ind., which used AT&T for WATS and long distance, lost service for two weeks when AT&T suffered a major switch failure.

That's when Dun & Bradstreet adopted a multiple-carrier policy, Bruggeman said. Now, Dun &

(continued on page 20)

GUIDELINES

BY ERIC SCHMALL

Dealing with a different kind of bypass

Nobody likes to be bypassed.

For telephone companies, bypass means losing revenue to private, user-controlled networks.

For communications managers, bypass means having authority usurped by end users. That includes end users who design their own networks and those who complain to a communications manager's superior.

There are many types of users who bypass communications managers. Some simply have no sense of policy or procedure. When they complain, they'd just as soon go directly to the chief executive officer as to the communications manager.

However, most end users bypass the communications department only when it is not responding to their needs. When end users become disenchanted with service, bypass flourishes.

Undoubtedly, bypass will increase. As telephone systems and computer networks become easier to use and manage, end users feel more comfortable about designing their own networks. They are also demanding better service and are not shy about complaining when they don't receive it.

Technological advances are hastening this trend. The last bastion of network sovereignty — determining how devices will be connected to hosts — is crumbling.

As users become more experienced at working with personal computers and continue attempting to interlink them, network managers must scramble to catch up with the crowd they are supposed to be leading.

(continued on page 20)

Schmall is network systems manager for an insurance holding company.

Diversity aids in disaster survival

continued from page 19

Bradstreet offices use one carrier for WATS service and another for regular long distance. If an office loses its WATS service, it can switch much of the WATS traffic to the alternate long-distance carrier.

Bruggeman admits there are some disadvantages to this approach. If WATS service fails, for example, WATS line users will have to pay higher long-distance rates and there would be reduced availability of open lines. However, Bruggeman said, the system will be adequate to carry the company until service is restored.

George Tabback, a director of Corporate Information Systems at Ingersoll-Rand Co. in Woodcliff, N.J., said his firm uses AT&T as its primary carrier and relies on other vendors for backup service. "We go out there and shop for different vendors basically to keep AT&T honest," he said.

Tabback said Ingersoll-Rand was unaffected by the AT&T fiber cut because it had just switched its southbound traffic to Lightnet, a long-distance carrier based in Rockville, Md.

According to DMW Enterprises' Mayfield, companies with large networks have other options besides using multiple carriers. Some have begun to develop networks that use dynamic routing between multiple nodes, a feature commonly employed by large carriers. This network topology avoids any single points of failure because traffic is automatically rerouted around a downed node or link.

Other large companies have installed redundant facilities, for example, a pair of parallel T-1 lines to each of their sites. They fill one line with their critical traffic and the other with switched voice traffic that can be dumped onto public circuits if either of the lines fails.

While these options are useful for large companies, analysts said, the bread and butter of contingency planning for smaller companies remains a multiple-carrier strategy. But there are some drawbacks to adopting such a plan — namely, having to deal with two or more service representatives, account executives, billing processes and rate schedules.

According to David Baumgarten, director of telecommunications at McGraw-Hill, Inc. in Denver, supervising a multicarrier network is the essence of a telecommunications manager's job.

"Once you have the administrative procedures in place for dealing with multiple carriers, it's not so painful, given the alternative of having all 48 of your office's communications channels go down because you had all your T-1s from one vendor. That takes a lot of explaining to upper management."

But using multiple carriers is no guarantee of safety either.

"Most fiber is running in the same easements along railroad tracks that crisscross the country," Baumgarten said. "Even though you might have different carriers and be on separate fiber strands, the odds are pretty good that between Chicago and New York your lines are all buried on the same railroad site. Someone digging in a railroad trench could take out several hundred strands of fiber with one cut, including all your redundant circuits."

Baumgarten said communications managers should insist that carriers provide information about how their circuits are routed so that single points of failure can be avoided. Baumgarten said this is a useful exercise for dedicated circuits. But voice traffic, if it is not carried on private lines, is carried on the public network.

"You can't say to a long-distance company, 'I don't want my calls going on your fiber.' " he said. "For voice traffic, I think it really is one of those facts of life that we are going to have to live with." ◾

Dealing with another kind of bypass

continued from page 19

The need for connectivity to a growing number of resources only adds to the bypass pressure now building on communications departments.

The bad news for communications managers is that bypass can never be eliminated. It can, however, be controlled. The key is to ensure that the communications organization is a resource rather than an impediment to building new networking applications.

Ironically, communications departments often become such impediments. This happens in several ways.

Sometimes, communications departments make service request procedures so difficult that end users try every conceivable means to avoid them. This happens in communications departments that don't review old service procedures. It is easy to grow comfortable with outdated guidelines that have little relation to emerging needs, new applications or changing corporate management structures.

At other times, communications managers simply become too weary of managing a difficult and changing department to develop new applications. Nearly all communications managers find themselves in this situation at one time or another. But they must fight the urge to stop moving ahead on new network services if they are to keep their end users satisfied.

To prevent bypass, communications managers must make sure they are effectively servicing end users. They must impress upon their staff the need to provide fast, reliable, courteous service.

To complement this, communications managers must seek out end-user feedback. Waiting for complaints allows end users to go around communications managers and talk to their superiors.

Communications managers must find ways to control bypass or they risk acquiring a poor reputation. This can affect not only budget allocations for a networking department but, ultimately, a communications manager's career. ◾

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Worth Noting

Next week: *Network World'* s Telecom Management Update looks at fiber-optic technology in the public-switched network and in Fiber Distributed Data Interface local networks.

First Look

Cabletron Ethernet media adapter bows

Cabletron Systems, Inc. recently introduced the **Extended Media Adapter,** a product that can be used to connect up to 10 Ethernet thin-wire devices to a twisted-pair Ethernet local network.

The Adapter, designed for use with Cabletron Systems' Multi Media Access Center hub, houses twisted-pair and thin-wire transceivers. The Adapter can be connected to the hub using a twisted-pair segment of up to 150 meters. Thin-wire segments on the other side of the device can extend up to 100 meters.

The Extended Media Adapter can be mounted on or within a wall. It is available immediately at a cost of $550.

Cabletron Systems, Inc., P.O. Box 6257, East Rochester, N.H. 03887, or call (603) 332-9400.

Nissei Electric unveils fax product

Nissei Electric USA, Inc. has introduced a product that functions as a facsimile machine, scanner, printer, photocopier and modem.

Called the **Nissei 5in1 Facsimile,** the product works with IBM Personal Computers, XTs, ATs and compatibles.

The 9-lb. Nissei 5in1 Facsimile contains its own internal modem and software, and it connects to the user's Personal Computer through an RS-232-C port.

The 5in1 offers facsimile-to-facsimile, facsimile-to-computer, computer-to-facsimile and computer-to-com-

(continued on page 24)

Okidata unveils line of modems

By Jim Brown
New Products Editor

MOUNT LAUREL, N.J. — Okidata, an Oki America, Inc. company, recently unveiled a series of modems designed for leased-line and dial-up operation, including a model that operates at speeds up to 14.4K bit/sec.

Three of the five new modems — the CLP 14.4, the CLD 4800A/B and the CLD 2400 — are designed for communications between data terminal equipment and host computers. The other two support communications between IBM Personal Computers.

The CLP 14.4 is CCITT V.33-compatible and supports synchronous point-to-point communications at speeds up to 14.4K bit/sec. It supports full-duplex transmission over four-wire leased lines and half-duplex transmission over two-wire leased or dial-up lines.

The modem supports fallback speeds of 9.6K bit/sec and 12K bit/sec and features a dialback function that automatically establishes two dial-up connections with a remote CLP 14.4 when the four-wire leased line fails. The modem will automatically switch back to leased-line operation when the dedicated line is functional.

Users can configure the CLP 14.4 using a front-panel keypad and LCD display, and they can store the map in nonvolatile memory. Configuration data can also be down-line loaded to remote CLP 14.4s.

CLP 14.4 supports CCITT V.52 modem test patterns for line quality and error rates, as well as V.54 loop-back diagnostics and Okidata proprietary diagnostics. Central-site users can monitor and test the operation of the remote CLP 14.4.

The CLP 14.4 costs $1,995.

Okidata's stand-alone CLD 4800A/B operates synchronously at speeds up to 4.8K bit/sec. It supports full-duplex communications and multipoint configurations when used with four-wire leased lines. Used with two-wire leased or dial-up lines, the CLD 4800A/B supports half-duplex transmission in a point-to-point configuration.

The CLD 4800A/B is compatible with Bell 208A and 208B modems and supports Racal-Vadic, Inc.'s Synchronous Automatic Dialing Language (SADL) autodialing protocol. SADL enables users to build autodial routines into communications programs supporting IBM's Binary Synchronous Communications, Synchronous Data Link Control or the High-Level Data Link Control protocols.

Like the CLP 14.4, the CLD 4800A/B can be configured via a front-panel LCD display and keypad. The CLD 4800A/B can also test and down-line load configuration data to remote CLD 4800A/Bs. The CLD 4800A/B costs $895.

The stand-alone CLD 2400 operates synchronously or asynchronously at 2,400 bit/sec. It supports full-duplex transmission over two-wire leased and dial-up lines.

The CLD 2400 includes an Okidata Security Callback Device Authentification (SCDA) feature. With this feature, the central-site CLD 2400 prompts remote users to enter a password. If the password is validated, the central-site device will hang up and call back the remote unit.

The CLD 2400 supports Hayes Microcomputer Products, Inc.'s AT command set and Microcom, Inc.'s Microcom Network Protocol (MNP) error correction and data compression.

CLP 14.4 supports CCITT V.52 modem test patterns for line quality and error rates.

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The CLD 2400 is CCITT V.22bis-compatible at 2,400 bit/sec and V.22-compatible at 1,200 bit/sec. It will work with Bell 212A and 103J modems, and it supports front-panel configuration and diagnostics. The CLD 2400 costs $549.

Lastly, Okidata introduced a pair of 2,400 bit/sec modems for IBM Personal Computers. The Okitel 2400 Plus is a stand-alone modem, while the Okitel 2400B Plus is a board that resides in a Personal Computer.

Both modems are Hayes-compatible and work with CCITT V.22 as well as Bell 212A and 103J modems. They support asynchronous transmission in full duplex over two-wire leased or dial-up lines.

Both the Okitel 2400 Plus and the 2400B Plus support MNP error correction and data compression, enabling the modems to achieve a throughput of 4.8K bit/sec.

Bundled with Okitel II communications software, the Okitel 2400 Plus is $549 and the Okitel 2400B Plus is $499.

Okidata can be reached by writing 532 Fellowship Road, Mount Laurel, N.J. 08054, or by calling (609) 235-2600. ◼

LAN gateway links micros to SNA nets

NSA's gateway supports dynamic allocation of logical units, 128 networked microcomputers.

By Paul Desmond
Staff Writer

LAGUNA HILLS, Calif. — Network Software Associates, Inc. (NSA) last week announced gateway software for IBM Personal Computers and compatibles as well as for Personal System/2s supported by token ring or other Network Basic I/O System-compatible local networks.

The AdaptSNA Gateway supports major Systems Network Architecture protocols and provides dynamic allocation of logical units, meaning any network-attached personal computer can connect to any local or remote logical unit, according to the company.

The gateway supports up to 128 concurrent logical units so that as many as 128 networked microcomputers can use it simultaneously.

Each workstation can appear as any of the logical unit types the gateway supports and can log off one type and onto another without losing the gateway session to the host. To support more than 128 logical units, multiple gateways can be attached to the network.

Protocols supported include interactive 3270, cooperative LU 6.2/Advanced Program-to-Program Communications, batch 3270/remote job entry and program-to-program LU 0.

AdaptSNA Gateway consists of Gateway Control Program (GCP) software that runs on a user-supplied personal computer or Personal System/2 attached to the local net and an AdaptSNA software package that runs on each networked computer.

Four AdaptSNA packages are available, one to support each SNA protocol. A fifth package, RemoteTalk, supports personal computer-to-personal computer remote control and file-transfer facilities. Any combination of software can run on the network.

The GCP software controls SNA host access and provides a range of security, control and status display features. The workstation on which it runs is not dedicated, allowing it to simultaneously function as a workstation and a host gateway. The gateway operator can hot-key between modes.

The AdaptSNA packs that run on the individual workstations are the same software products NSA has sold for five years to link stand-alone personal computers

(continued on page 24)

Racal-Milgo PAD supports up to 32 X.25 net ports

By Rex Bowman
West Coast Correspondent

SUNRISE, Fla. — Racal-Milgo recently introduced an asynchronous ASCII packet assembler/disassembler designed to give small and midsize nets access to X.25 networks.

The Omnimux PNA X.25 PAD is the latest in Racal-Milgo's line of X.25 products. In addition to handling data in the X.25 format, the PAD complies with CCITT X.3, X.28, X.29 and X.121 addressing recommendations.

The PAD's features include dual links, load balancing, compatibility with Hewlett-Packard Co.'s 3000 minicomputer, certification for use on the federal government's Defense Data Network (DDN), down-line loading of parameters, use of up to 100 passwords and an optional internal modem.

The Omnimux PNA X.25 PAD is based on the architecture of Racal-Milgo's Omnimux 82 series of statistical multiplexers, according to Nick Schklair, product line manager for Racal-Milgo. This allows users of Omnimux 82s to have their multiplexers converted for use as PNA X.25 PADs with few software changes and relatively minor hardware changes, Schklair said.

The PAD supports from four to 32 ports and comes in three versions: an eight-port model, a 16-port model and a 32-port model.

According to Schklair, Racal-Milgo had originally intended the PAD to be used for X.25 applications on the DDN.

Because many HP 3000s are tied into that net, the company built the PAD to be compatible with the asynchronous protocols of those minicomputers. The asynchronous protocols are slightly different from ASCII protocols.

The dual-link feature allows the PAD to support two separate

(continued on page 24)

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Gateway links micros to SNA

continued from page 21

to hosts via IBM's Synchronous Data Link Control protocol and coaxial connections to 3174 terminal controllers or asynchronous links. To move from one link type to another, users simply exchange link drivers.

NSA said its gateway provides for distributed functionality and control not found in other local network-to-host gateways. Since each networked personal computer runs its own AdaptSNA emulation program, each can take advantage of its full intelligence rather than simply acting as a dumb terminal.

The AdaptSNA gateway can be connected to a host via any of the following: a direct SDLC link to an IBM 37X5 front-end processor; a remote SDLC link using an SDLC adapter card and a synchronous modem; or a remote synchronous link using a Hayes Microcomputer Products, Inc. V-Series Smartmodem, which does not require an SDLC board. The maximum combined throughput to the mainframe is 56K bit/sec.

Pricing for the gateway varies depending on configuration. A typical configuration that supports eight workstations starts at about $2,000. Currently being beta-tested at several sites, the product will be available in January.

For more information, contact NSA at 22982 Mill Creek, Laguna Hills, Calif. 92653, or call (714) 768-4013. ◼

PAD supports 32 X.25 net ports

continued from page 21

9.6K bit/sec links. Those links can terminate at the same location or one link can connect to one X.25 network while the other link connects to a second X.25 network.

The load-balancing feature lets the PAD shift traffic from one link to another if one becomes congested.

The PAD can be attached to an X.25 network through either dial-up or dedicated facilities.

The password feature allows users to restrict X.25 network access to authorized users only. Ports can be configured for passwords in groups, meaning the user could program Ports 1 through 10 to require the use of passwords, while Ports 11 through 32 would not require passwords.

The eight-port model of the Omnimux PNA X.25 PAD carries a price of $2,760, the 16-port model is priced at $5,200, and the 32-port model costs $8,980. The cost of upgrading the Omnimux 82 series of statistical multiplexers has not yet been determined, Schklair said.

To reach Racal-Milgo, write to 1601 N. Harrison Pkwy., Sunrise, Fla. 33323, or call (305) 475-1601. ◼

First Look

continued from page 21

puter transmission, as well as image scanning, printing and copying.

The Nissei 5in1 Facsimile is scheduled for availability in early 1989 with a suggested list price of $2,999.

Nissei Electric USA, Inc., 3 Reuten Drive, Closter, N.J. 07624, or call (201) 768-0085.

E-mail software for MS-DOS 3.1 nets debuts

Transend Corp. recently announced a new version of its electronic mail software that can be used to transport messages and files within and between MS-DOS 3.1-compatible local networks, including those developed by IBM, Novell, Inc., 3Com Corp. and Banyan Systems, Inc.

PC Complete also features a "personal gateway" that allows individual users on the network to send and receive messages through public and private E-mail services without having to access a dedicated file server.

The software supports many E-mail systems, including MCI Communications Corp.'s MCI Mail, Hewlett-Packard Co.'s HP Desk and AT&T's AT&T Mail.

PC Complete allows users to send and receive messages while working on another application. A screen prompt and audible signal notifies users when mail is pending. Users can then press a designated hot key that creates an E-mail window within their application. Users can read and reply to their mail and then return to their previous application.

PC Complete is priced at $229 and will be available during the first quarter of next year.

Transend Corp., 884 Portola Road, Portola Valley, Calif. 94025, or call (415) 851-3402. ◼

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Vaccine buyers: Beware antidotes

continued from page 17

information on his hard disk when he tried to run Microsoft Corp.'s Microsoft Word software. Another product, when running on an IBM Personal Computer, did nothing, David said. He later discovered it was because the vendor had tested the product on an IBM clone, not an IBM-manufactured machine.

David said users should not assume vaccines will work on their equipment and should test the products themselves. "You have to put it into your exact environment with your hardware, your operating system and your combination of software," he said. "If you work in an office, you might have five or six different clones floating around. The product has to be tested on each one."

Analysts also said most vaccines protect only against certain types of viruses — those already encountered and unraveled. While users may assume they are protected by these products, they will still be vulnerable to any new types of virus programs that come along.

Dr. Harold Highland, editor of *Computers & Security*, said that while some vaccines are effective in protecting against known viruses, there is no such thing as a vaccine that is 100% effective. "There are products that protect the hard disk, but if you can't update the hard disk, what did you buy it for?" he said.

Delbert Jones agreed with Highland. Jones is managing director of the National LAN Laboratory, a nonprofit organization funded by membership fees from local net and computer vendors. The group recently issued a set of recommendations on virus control ("LAN Laboratory sets security guidelines," *NW*, Nov. 14).

"There is no such thing as a perfect cure," Jones said.

In its recommendations, the group encouraged users to conduct stand-alone tests of all new software and to immediately make backup copies. It did not recommend use of vaccines because they target only specific, known viruses and instill a false sense of security in users.

Vaccine vendors take a different view. Eric Hansen, vice-president of Digital Dispatch, Inc. of Minneapolis, said his company's Data Physician product is effective at identifying and removing viruses from IBM Personal Computers and compatibles that use the MS-DOS operating system.

"I would be very surprised if someone actually were to write a virus designed to thwart virus detection techniques to the level necessary to beat our package," he said.

Hansen said hackers are not tempted to write viruses aimed at circumventing vaccines, as some observers fear, because the installed base of vaccines is not large enough. Digital Dispatch, which developed the first version of Data Physician about four years ago, has sold roughly 5,500 copies of the product, he said. It costs $199.

Still, Hansen said his company does not advertise the vaccine because it does not want to encourage hackers to experiment in virus-writing. Such experimentation is exactly what the industry fears, Jones said.

The hacker challenge

"[Vaccines] stimulate the development of more virulent viruses," Jones said, since hackers consider it a challenge to write viruses that can outwit vaccines. "The industry does not want to support anything that could cause more disasters."

Jones stressed that the LAN Laboratory is not accusing any vaccine vendor of abuse. "It's the concept in general that the industry is concerned about."

Highland said some mom-and-pop vaccine vendors publish new product announcements before they have even developed the vaccine software they are marketing. They then hire an answering service to take calls in order to gauge interest in the product. "I look at the industry and say, 'Hey, most of them are a bunch of guys on a make-a-quick-buck scheme.' "

Hal Tipton, president of the Information Systems Security Association, a nonprofit group that exchanges information on security problems, said there are some basic questions users should ask vaccine vendors. What types of viruses does the product protect against? What methods does it use to detect viruses? How much computer space or time does it take? Who has tested the product and can verify what viruses it was tested against? "You need to be very careful in this whole area," he said. ◼

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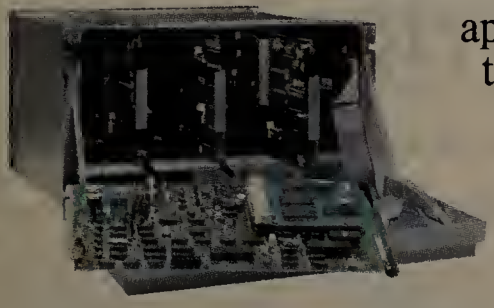

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OPINIONS

OSI

BY CLARE FLEIG

Leading the way to OSI migration

After more than 12 years in the making, Open Systems Interconnection is finally becoming a reality.

The long evolution of OSI and its widespread use in Europe have produced high expectations on the part of network administrators, planners and users who have been waiting for a better way to communicate. But, unfortunately, the wait for OSI has built expectations to dangerously high levels. Today, when a communications problem or inconsistency arises, it is often met not with a specific response but a wave of the hand and a stated or implicit belief that OSI will handle it.

OSI is an important, emerging standard for communications, but it is unrealistic to think that it will solve every communications headache or that it will work effectively with every product now available. The key to OSI products is how they function in their environment. OSI products should not be judged strictly on their own merits but on their interoperability with existing environments.

> OSI products should be judged on their interoperability with existing environments.
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Interoperability means that OSI products must work effectively within the confines of users' current communications infrastructure, regardless of the base of that infrastructure. In that context, users and vendors looking at OSI's potential must consider three points.

■ **OSI products are not here yet.** Implementation of the OSI model in the U.S. continues at a slow but steady pace, in sharp contrast to the European development cycle. For example, IBM's product line, available now in Europe, will not be available in the U.S. until 1990.

This gradual move to OSI, however, is as much a result of a lack of customer demand as of slow vendor implementation. Users in the U.S. have not yet accepted the OSI model to the extent that Europeans have, which naturally has caused vendors to pace their rate of development.

■ **OSI is not a panacea.** The OSI model is being developed to provide as full a communications environment as possible, but questions of interoperability will take some time to resolve. The OSI approach can be compared to a two-year business forecast. The forecast, like the OSI model, points out the direction the organization should take. But each manager will undoubtedly make his own interpretation of the plan as it relates to his division or group. In the OSI environment, each vendor will implement key components of the model according to its customer base, product set and company strategies. There is no guarantee that different implementations of the same protocol by different vendors will work together.

■ **OSI products are not needed by all network planners.** Companies now standardized on IBM's Systems Network Architecture, Digital Equipment Corp.'s DECnet, Sun Microsystems, Inc.'s Network File System or Transmission Control Protocol/Internet Protocol should not migrate to OSI just because it is touted as the emerging environment. OSI support makes the most sense in multivendor or multinational environments in which, for example, the number of gateways outstrips room available on the network.

OSI products are definitely on the way. As they reach the market, vendor claims for OSI and for specific products based on OSI will escalate. But all product claims must be verified by users according to the product's interoperability with their own environment. ◘

Fleig is director of systems research at International Technology Group, a Los Altos, Calif.-based research and consulting firm specializing in the IBM market.

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An IDG Communications Publication

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EDITORIAL

Telecom industry faces an era of carrier battles

The long-distance telecommunications industry is entering a new era of competition led by a feisty AT&T, which finds it increasingly necessary to fend off a pack of aggressive competitors.

MCI Communications Corp. and US Sprint Communications Co. have now signed on many large business customers, and AT&T's share of the switched long-distance business has slipped below the magic 70% level.

It has long been believed that AT&T would tolerate loss of market share as a stalking-horse in its bid to gain regulatory freedom but that it would start to fight back if that level dropped below 70% for fear of losing the ability to steer the market.

When measured in switched access minutes as billed by the local exchange carriers, AT&T's market share dropped from 80% in the fourth quarter of 1984 to roughly 69% in the second quarter of this year, according to the Federal Communications Commission. Although AT&T still controls 78% of all industry long-distance revenues, it cannot tolerate the further loss of basic long-distance traffic.

The first sign that AT&T thought it was time to fight back surfaced last year when it introduced Tariff 12, a scheme under which the carrier can offer custom network packages that draw from its portfolio of tariffed services. But the gloves didn't come off until last spring, when AT&T introduced the controversial Tariff 15, which enables it to offer off-tariff prices in competitive situations.

Although these two tariffs are undoubtedly the most significant competitive advances the company has made, AT&T is supporting its frontal assault with a bevy of other announcements intended to reduce the cost of its services and match innovations developed by competitors.

In the last few months, AT&T has revisited all of its mainstream business services, including WATS, Accunet T1.5, Software-Defined Network and international services. Many of these services were affected in a sweeping price reduction announced in October, but nowhere is the competitive agenda more clear than with the revisions made to WATS.

> Although AT&T still controls 78% of all industry long-distance revenues, it cannot tolerate the further loss of long-distance traffic.
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In AT&T's October announcement, the company said it would do away with its WATS banded pricing scheme in favor of a distance-sensitive tariff similar to its competitors. The company also announced it would make it possible to access WATS using standard long-distance trunks as opposed to WATS access trunks. MCI, US Sprint and others have used both service options to lure accounts away from AT&T.

Other signs that AT&T is taking the competition more seriously include the recent announcement of MultiQuest, an interactive 900 calling service for information providers, announced just two months after MCI rolled out a similar service.

While the WATS and MultiQuest reactions seem relatively insignificant, they may indicate a change of heart at AT&T. No longer can the long-distance giant casually dismiss innovations by competitors. Its archrivals are catching up technologically. US Sprint recently completed the deployment of Signaling System 7, an advance that should pave the way for the company to offer many of the services based on Common Channel Signaling that AT&T currently offers, such as Advanced 800.

But with US Sprint offering these services over its all-digital fiber-optic network, the fabric of competition could change very quickly.

While AT&T's fears of another antitrust suit may cause it to pull a few punches, users can still expect the company to draw blood during the imminent multibillion-dollar long-haul battle.

Luckily for users, they're the ones who benefit most from the fighting. ◘

OPINIONS

VIDEOTEX INDUSTRY
BY JAMES MCGOWAN

Lessons learned from the Minitel phenomenon

How has France created a videotex industry that offers 7,000 individual services generating 2.5 million on-line hours every month? The typical answer — government subsidy — is overly simplistic and basically incorrect.

If French government subsidy was the reason for the Minitel phenomenon, then the similar efforts launched by the German and British national telecommunications agencies should also have been successful. But those large videotex projects have turned out to be as lackluster as the efforts of the American publishing industry.

In 1980 and 1981, the Minitel project produced only a slight increase in the data traffic flowing on Transpac, the French national data network. But in 1982, traffic exploded when the Teletel 3615 Kiosque was introduced as a network enhancement. The Kiosque fundamentally changed the way end users and host operators related to the network. It was a breakthrough that is in the process of being emulated in the U.S. by the regional Bell holding companies.

The Teletel Kiosque allows end users to dial one number anywhere in the country to browse through and purchase electronic services on an impulse — without the need for prior subscription to that service. The bill for access is conveniently processed and collected by the telephone company, with about two-thirds of the amount forwarded to the appropriate host system operator. It's a simple formula, but its impact is great.

The electronic Kiosque allows consumers of information services the same ease of access that customers enjoy from a traditional newsstand. At a newsstand, patrons can buy a publication without a subscription. They pay only for the specific item they choose.

Since the Kiosque allowed new services to be introduced to the entire French population practically overnight, entrepreneurs eagerly jumped into the market and created compelling services and host computer systems in what rapidly became a highly competitive market. News, electronic mail, home shopping and banking, travel and ticket reservations, specialized information services and users groups have flourished over the past six years.

The Kiosque has also had a powerful decentralizing effect — most of the actual services are operated by independent organizations.

The market for interactive services now resembles that of a television ratings war fought daily, with the most creative and best-marketed interactive services winning big.

However, the ultimate winner is the Transpac network, which receives a piece of the total traffic. Transpac now carries more traffic than the rest of the world's public data networks combined.

> The RBHCs should concentrate solely on the formidable task of implementing seamlessly functioning gateways.
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The RBHCs are calling their versions of the Kiosque "public access gateways." In France, automatic number identification is used for billing, but most of the RBHCs plan to use personal identification numbers to identify and bill users. The end result should be the same — a decentralization of information providers offering exciting new services to the consumer and business user through the gateway.

The carriers should not try to consider their gateways as oriented toward either consumers or businesses — by its nature, a gateway is oriented toward both. With tiered pricing, a gateway can attract consumers to low-cost services that may also be partially subsidized by advertising, and at the same time it can attract business users that are willing to pay a lot more for strategic information and other services.

Some carriers are making an effort to provide host computer services along with their gateway offerings. They are trying to expand into ancillary markets before they even have an operating gateway.

As the first order of business, the RBHCs should concentrate solely on the formidable task of implementing gateways that function seamlessly — their primary task as telecommunications carriers. Implementing and operating a gateway that serves end users and host operators well is a complex job and is critical to the foundation of the new videotex industry. The RBHCs must not get sidetracked from building the firm foundation of fully functioning gateways. Once this foundation is in place, entrepreneurs will step in to fill any existing gaps in the marketplace.

Equal treatment of diverse host system operators is characteristic of a healthy and dynamic gateway offering. When a carrier provides host services, it not only diverts limited resources into an entirely different business but also stifles the opportunities for new content providers to creatively offer new services.

Right now, the modem-equipped microcomputer market has an adequate population of users to stimulate traffic on the gateways. The next natural step for the RBHCs to take after implementing gateways is to offer inexpensive, easy-to-use terminals to the public for accessing the gateways and the concomitant services. This is a task beyond the scope of entrepreneurial companies due to its capital-intensive nature.

The RBHCs have a vested interest in opening access to their gateways, and terminals would allow the computer-illiterate and underprivileged population to have inexpensive access to the new media environment.

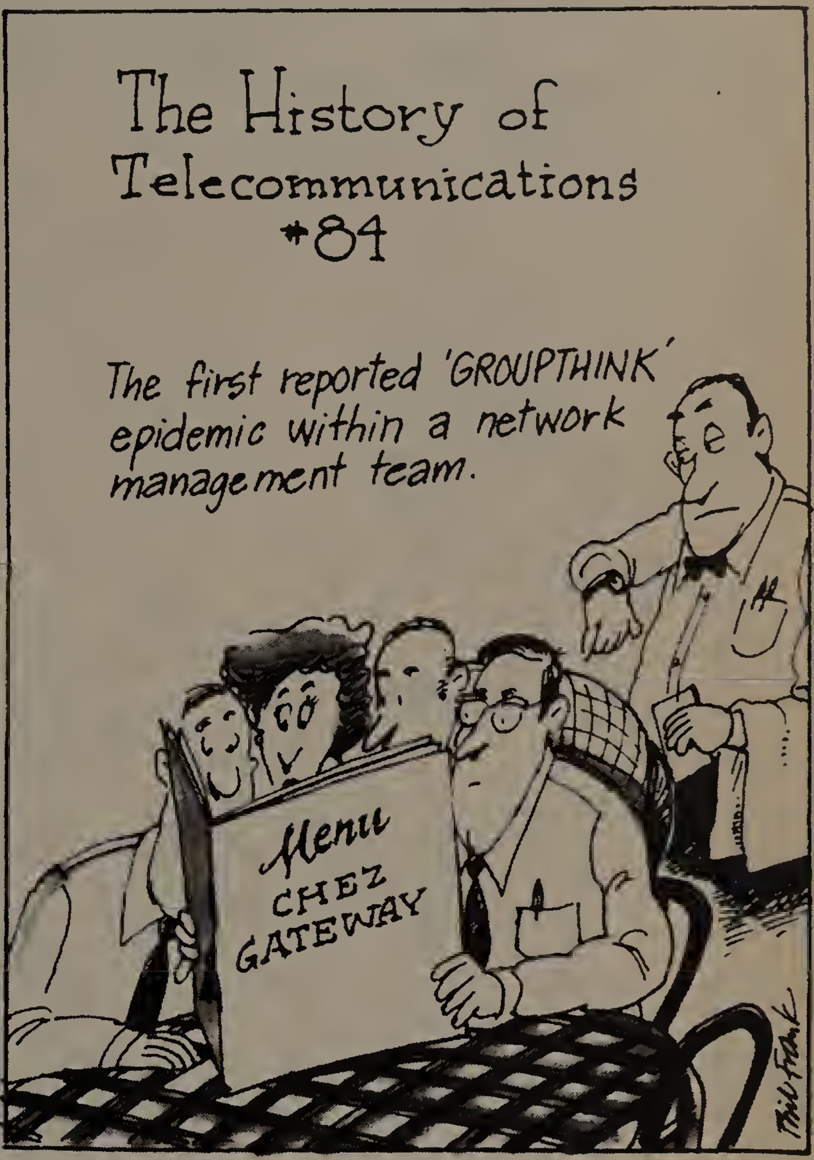
We are now approaching a time when the regulations restricting the RBHCs from designing and marketing customer premises equipment will limit public access to new information services. These regulations should be eased if the RBHCs show a willingness to lease terminals.

By offering economical gateways and participating in terminal distribution while leaving information service storage to the entrepreneurial market, the RBHCs would be laying a stable foundation for the videotex industry in the U.S. ◼

McGowan is president of Telesource, Inc., a communications and information service firm in New York.

TELETOONS

BY FRANK AND TROISE


The History of Telecommunications
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LETTERS

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We here at Schneider National, a trucking company, are proud to have such a dedicated defender of the network and the American Way. Thank you and Phil Frank and Joe Troise for bringing her out of the closet. Keep up the good work.

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Manager
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FEATURES

A multitude of messengers

By JUDITH ROSALL

Many user organizations today find themselves confronted with a multitude of different electronic mail products and services. Nearly every vendor in the value-added network, local net, data base and computer system markets is pitching its own version of an E-mail system, gateway or intersystem connection service.

For unwary companies, poorly planned equipment purchases can result in incompatible and redundant messaging systems, each of which turns the department it serves into an isolated "information island."

This, in turn, creates a difficult situation for companies that later decide to integrate their disparate messaging systems into cohesive, enterprisewide strategic information networks.

In some cases, the cost of integration causes users to forego systems that could give them significant competitive advantages.

The challenge of integrating messaging and information systems will force companies to develop inter- and intracompany applications that transcend all systems and information types, reaching across entire multinational organizations, regardless of geographic boundaries.

One popular way to integrate stand-alone E-mail systems — and thereby provide a common mail service and a companywide information backbone network — is to begin with a strategy based on E-mail software gateways (users and vendors often use the terms "mailbridge" and "E-mail gateway" interchangeably). But before a specific gateway solution is chosen and implemented, several key architectural approaches should be analyzed.

Three specific approaches will be discussed in this article: a standards-based approach, a mailbridge and backbone network approach, and a personal computer local net-based E-mail system approach.

Standards approach

This approach uses CCITT X.400-based gateway software or mail systems for the interconnection of proprietary mail systems in either a private or public network. The X.400 standard is an important advance in E-mail and is expected to become the most widely used message-transport agent for electronic messaging.

The X.400 architecture supports additional applications beyond the exchange of electronic messages and documents. An X.400 network can facilitate electronic

(continued on page 32)

Rosall is a telecommunications consultant with the network planning and design group of the Bank of Boston.

One user's perspective on today's crowded electronic messaging marketplace

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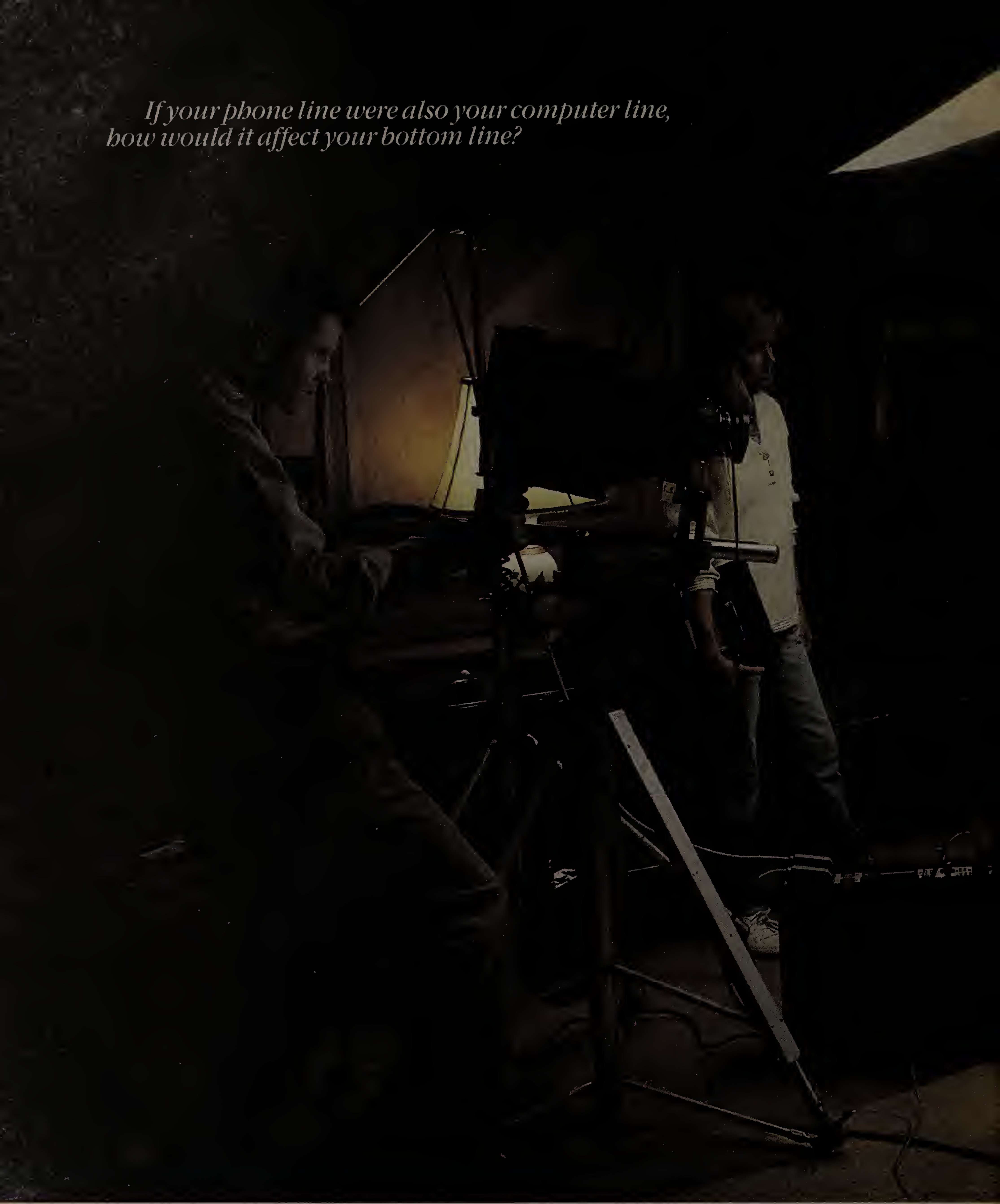
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(continued from page 28)

funds transfers, as well as electronic forms transfers based on electronic data interchange (EDI), over multiple computer systems.

X.400-based systems can exchange binary files and spreadsheets, computer-aided design and manufacturing files or other graphics information, digitized voice and facsimile.

Even an organization with a single internal mail system can benefit from the X.400 standard, which allows it to easily connect its users to outside private or public E-mail systems or services that also conform to X.400.

U.S. X.400 vendors

Specific vendors currently offering X.400-based products for the U.S. market include Digital Equipment Corp., Data General Corp., Wang Laboratories, Inc. and Retix, which makes a local net-oriented X.400 gateway product, according to Eric Arnum, editor of "Electronic Mail and Micro Systems," a newsletter published by New Canaan, Conn.-based International Resource Development Corp.

These vendors are joined by telecommunications carriers that are marketing X.400 services now or plan to do so soon. Arnum says these carriers include AT&T, Telenet Communications Corp., MCI Communications Corp., Nippon Telephone and Telegraph Corp., Dialcom, Inc. and Pacific Bell. Apollo Computer, Inc., IBM, Soft-Switch, Inc. and Hewlett-Packard Co. are expected to deliver their X.400-based products for the U.S. market sometime during the fourth quarter of 1988 or in early 1989.

The current crop of X.400 products and services is based on the 1984 X.400 series of standards and is limited to the exchange of text-only messages. According to Steve Wendler, program director for office information systems services with Gartner Group, Inc., a consulting firm in Stamford, Conn., the new 1988 version of X.400 will not be fully implemented by major vendors before the second half of 1991.

Some new messaging enhancements included in the 1988 X.400 series are:

- 24-hour-per-day message transfer.
- Extensive security features, including proof of delivery and origination, particularly for messages dealing with financial transactions; integrity of content; prevention of unauthorized disclosures; and validation services.
- Group distribution lists that allow the sender to address a group of recipients by naming the group rather than enumerating each of the recipients by name.
- Physical delivery — the ability to deliver a message originated by an X.400 Message Handling System (MHS) user to a non-X.400 user.

According to Wendler, some vendors intend to pursue a gateway implementation strategy for the X.400 standards. Their products will provide a bridging function between vendor-proprietary offerings and the standards. Other vendors, most notably DEC, are expected to embrace the X.400 and X.500 standards in future products.

Advantages

The primary advantage to the standards-based approach is that it supports vendor-independent E-mail exchange based on International Standards Organization (ISO) Open Systems Interconnection protocols.

Specifically, this permits multivendor connectivity among proprietary E-mail products that offer X.400 support, such as DEC's All-In-1, IBM's Professional Office System (PROFS) and Wang Office. It also eases connectivity among a host of public E-mail service providers and international post, telegraph and telephone administrations that support X.400.

The primary advantage to the standards-based approach is that it supports vendor-independent E-mail exchange based on OSI protocols. This permits multivendor connectivity among proprietary E-mail products that offer X.400 support.

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Companies that adopt a standards-based approach can offer services that provide competitive business advantages. Some of these services include administrative messaging to a range of recipients, regardless of their organization or geographic location; easy computer-generated facsimile document exchange; electronic processing of business forms; and communications links to key business sites, whether they are customers, suppliers or remote departments and divisions.

Standards-based architectures also provide a platform for future integrated applications that will support global transport of multiple types of information. X.400 was designed from the beginning to facilitate transport of digital voice, graphics, facsimile, image, text and binary data for use with compound documents.

Disadvantages

Due to the slow pace of the standards approval process, standards-based products are not yet as rich in functionality as vendors' proprietary electronic messaging products.

Specifically, X.400-based products currently on the market lack final-form document editing capabilities, binary file-transfer capabilities and adequate security and distribution capabilities. Industry observers predict these functions and others will be incorporated into the current standards-based products.

More importantly, the 1984 X.400 standards lack global directory synchronization capabilities. The X.500 standards are designed to provide the maintenance of global distribution lists as well as networkwide and internetwork directory services, such as user queries of the directory. Currently, because the X.500 standards are relatively immature, they provide a set of functions that is simple in comparison with some major vendors' proprietary products.

Vendors have also been slow in this critically important area, but they are making substantial efforts to provide products with distributed directory services within the next six to eight months.

Due to the technical complexity of creating a synchronized directory, the X.500 series may not be complete enough to provide users with the robust services they require for intra- and intercorporate E-mail until 1993.

Another short-term disadvantage to this approach is the lack of X.400 product certification by the Corporation for Open Systems. This may not be feasible until mid-1989. Without such certification, though, users could encounter product incompatibility problems with current X.400-based products.

Users will have to pay close attention to the standards profiles supported by each vendor's product, and they should conduct rigorous on-site interoperability testing before accepting X.400 products. This will require a significant investment of manpower for planning, installation and maintenance.

Mailbridge approach

In this approach, a subnetwork, or utility backbone network, exists within a corporation's overall networking structure. The main E-mail switching hub or node, residing on a mainframe or minicomputer, provides the software support and a common set of functions, including E-mail (intra- or intercompany), document translation and global E-mail gateways.

This approach could also be used for applications that use a particular vendor's transport software — such as DEC's Message Router or any product based on X.400 protocols — and that need to transfer data throughout a multivendor environment.

Other features of this approach include application management services for automated system management, exception reporting and management action procedures.

Offices and departments can gain access to the backbone network through individual personal computers or minicomputer terminals, or through departmental servers connected via a departmental E-mail system.

If the terminal or personal computer is attached to a server, the server can provide a local mail service that networks into other corporate mail services or external mail services worldwide.

Two major players in this area are DEC, with its Mailbus product, and Soft-Switch, based in King of Prussia, Pa. These two companies' solutions differ chiefly in the types of E-mail packages that can be interconnected, the flexibility of their application program interfaces (API), the robustness of their directory synchronization, their ability to pass binary files and their support for local net-based E-mail systems and other types of network architectures.

DEC's Mailbus

Mailbus is a set of software products, based on DEC's Message Router Software, that acts as a transport system carrying messages between different E-mail systems. Mailbus consists of a distributed directory service, a messaging management service, DEC's message-router transport software and a series of gateways that connect to popular E-mail systems.

These systems include All-In-1, VAXMail and UltrixMail; IBM's PROFS and Systems Network Architecture Distribution Services; MCI Mail; and other systems that support the X.400-based gateway products.

In keeping with DEC's objective to provide all services and connections for an enterprise-wide E-mail network, Mailbus also offers a message router transfer service with a programmable interface that supports any user-written applications that require nonreal-time store-and-forward message transfers.

The 1988 version of the X.400 standard will affect future Mailbus enhancements. DEC has stated that, as these standards mature, it will move quickly to migrate the services offered by the standards into Mailbus.

In addition, upgrades to the Mailbus directory service are likely to appear as the X.500 recommendations are approved.

Pros and cons

DEC has been a leader in developing X.400-based products, and it is one of the few vendors that intends to incorporate the X.400 protocols into all of its E-mail products. It appears that DEC will layer proprietary elements on top of its native OSI implementations.

Mailbus offers a high-level programming interface — the Message Router Programmer's Toolkit — that simplifies the writing of gateways to other E-mail systems. Access to other E-mail systems may be necessary for two reasons: to permit the replacement of obsolete mail systems by gradually migrating users to a new system; and to enable internetworking with users of other vendors' systems and public E-mail systems.

The Mailbus product is still relatively new, however, and does not provide a wide array of off-the-shelf gateway products. In particular, the user would have to write gateways for office system products, such as Wang Office; local net mail products, such as Novell, Inc.'s Coordinator; and some public E-mail services. Telex and facsimile gateways are also missing from the Mailbus product.

Built-in file-transfer services are also lacking. Users can gain this capability by writing their own software routine to interface with Mailbus, but that requires additional programming and internal resources.

Users that have purchased Mailbus products are primarily DEC shops with available programmers and system support personnel.

Soft-Switch

Soft-Switch offers a wide array of off-the-shelf E-mail gateway and editable document interchange products that connect to DEC, Wang, HP, NBI, Inc. and IBM private E-mail systems; public mail services such as MCI Mail and Dialcom; Transmission Control Protocol/Internet Protocol mail systems; and 3Com Corp., Banyan Systems, Inc. and Novell local net E-mail systems. X.400 support is expected by the first quarter of 1989, according to Bob Falco, product manager at Soft-Switch.

Soft-Switch has aggressively positioned its products to meet users' requirements for multivendor E-mail gateways. The company recently committed to developing an MHS-based support capability similar to that of DEC's Message Router but allowing different E-mail systems running on personal computer local nets to communicate.

In the first quarter of 1989, Soft-Switch also intends to deliver a new directory service product that provides directory syn-

(continued on page 34)

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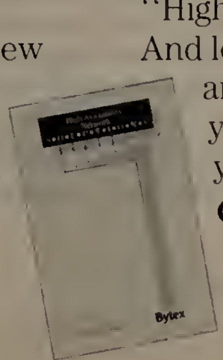

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chronization across all E-mail systems. This would mean easier and less costly directory administration. Additional application development is focused on library services and EDI.

Soft-Switch also provides interconnection to word processing systems and supports document translation for IBM's Displaywriter; NBI's 8, 64, 3000 and 4000 word processing systems; and Wang's OIS and VS. Translation services are also available for IBM's DisplayWrite/3, DisplayWrite/4 and DisplayWrite/370; Ashton-Tate Corp.'s MultiMate; DEC's DX; and Wang's Word Processing.

Pros and cons

Soft-Switch provides full-function, transparent, multivendor integration at the mainframe, departmental computer and personal computer levels. The company also offers centralized accounting facilities, which can serve as a basis for chargeback systems when tracking usage.

Soft-Switch has gained momentum in selling its products to large companies, and its installed base has grown steadily over the last two years. The variety of the Soft-Switch product line will protect a company's investments in training and multivendor E-mail installed base.

Soft-Switch's proprietary software does not address native OSI product migration strategies, but the firm has announced support for X.400 via a separate gateway approach. Soft-Switch has been considerably slower than other vendors in offering standards-based products. Its products will have greater difficulty running in a fully compliant OSI environment because of their proprietary nature.

Users will have to depend on Soft-Switch's ability to conduct product research and development in support of future innovative product offerings.

The PC LAN solution

As the installed base of personal computers and local-area networks continues to grow, so does the array of local net-based E-mail products. Local net E-mail users can now enjoy E-mail interfaces that take advantage of the personal computer's easy-to-use, icon-driven E-mail software, as well as its decreasing communications and server costs.

Other options on the local net E-mail horizon include an interconnection gateway software product that performs the same basic function as DEC's Message Router.

Action Technologies, Inc. of Emeryville, Calif., has developed a product called Message Handling Service that allows different E-mail systems running on personal computer local-area networks to communicate with other local net mail systems without requiring a minicomputer or mainframe to serve as the central mail switching device.

Hughes Aircraft connected its numerous E-mail systems — PROFS, All-In-1, HP Desk, VMS Mail, MCI Mail and various local nets — by using the E-mail backbone approach and installing Soft-Switch's proprietary E-mail gateway products about two years ago.

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The key attribute of Message Handling Service is that it provides transparent communications or a simple interface between applications on different local net hardware. The product can be used for communications between applications running on everything from Apple Computer, Inc. Macintoshes to Novell NetWare local nets.

Message Handling Service will also facilitate the transport of business forms or transactions to data bases or other types of applications for remote processing. Fourteen personal computer and local net vendors, including Novell, now support Action Technologies' Message Handling Service product. APIs are not yet built into it.

Some public network service vendors, such as AT&T and Telenet, have announced their entrance into the local net E-mail business. AT&T offers its PMX software, which runs on Unix machines and can be linked to Ethernet and Starlan local nets. Telenet has formed a group to develop private E-mail software and has announced its intention to produce a local net version of PC Telemail.

Another breakthrough for local net E-mail users is a new local-area network-based X.400 E-mail system recently announced by Retix, an interconnect software company in Santa Monica, Calif. This system includes the company's RetixMail and OpenServer 400 software, which enables local network-attached IBM Personal Computers to exchange messages with remote X.400-compatible systems, including mainframes and minicomputers.

RetixMail and OpenServer 400 also allow microcomputers on the network to exchange E-mail messages and files based on X.400 products. In addition, the software includes an API that helps third parties and end users develop links between existing personal computer applications and OpenServer 400.

According to Retix, planned enhancements of these products include support of OSI applications, such as file transfer, access and management (FTAM), virtual terminal emulation, X.500 directory services and network management.

Pros and cons

There are several advantages to the local net-based solution. For instance, local net E-mail system costs for hardware, software and communications are considerably lower than minicomputer- or mainframe-based E-mail systems. With the number of personal computer workstations increasing rapidly, the practicality of local net-based E-mail systems becomes more obvious.

Also, local net E-mail APIs can be written to connect to a global wide-area network. Once X.400-based products for local networks are in place, personal computer users will be able to communicate with multivendor internal and external mail systems via X.400 gateways.

One drawback to this approach is that local net vendors have been slow to adopt the X.400 protocol standard. Major vendors, such as Novell, 3Com and Banyan, plan to support this standard, but delivery of these products to the marketplace has not yet been announced.

User strategies

At the annual Electronic Mail Association (EMA) meeting held in Boston last month, numerous Fortune 500 companies revealed ambitious intra- and inter-company electronic messaging strategies. One strategy that seemed to take the breath away from even the most jaded of attendees was that of Hughes Aircraft Co.

Hughes, a $7 billion corporation based in Los Angeles, currently has more than 30,000 E-mail users in 32 locations worldwide. Hughes connected its numerous E-mail systems — PROFS, All-In-1, HP Desk, VMS Mail, MCI Mail and various 3Com, Novell and Appletalk local nets — by using the E-mail backbone approach and installing Soft-Switch's proprietary E-mail gateway products about two years ago. Hughes is also beginning to look at standards-based E-mail backbone products such as DEC's Mailbus.

According to Bud Huber, manager of advanced networking integration at Hughes, the company's E-mail backbone network approach is going through an evolutionary process.

"The only way we will be able to achieve interoperability among our automated information systems will be through the adoption of open architecture standards and the utilization of networking products that use these standards," Huber says.

"We understand that Soft-Switch will be coming out with their X.400 standards-based product in the near future," he adds. "When this product is in full production, we will also evaluate it."

Huber says Hughes is pushing vendors as hard as it can in this area. "Whether we stay with Soft-Switch's X.400 gateway product or go with a product like Mailbus depends on many factors that are yet to be determined," he says. "We must first get the vendors' standards-based products on the market."

In a large business environment, even though proprietary approaches can provide more functionality, no single vendor can support a large corporation with its diverse systems, Huber says. "The Achilles' heel is that you may have to go with standards over functionality," he says. "There will not be a one-vendor solution. We will have to work together."

The proprietary way

In contrast to Hughes' approach, San Francisco-based Bechtel Group, Inc., one of the world's largest construction companies, has taken the proprietary approach.

According to Bill Howard, vice-president of information technology for the company, Bechtel also has installed Soft-Switch's gateway products to connect its PROFS, All-In-1, DEC-Mail, MCI Mail and personal computer local network E-mail systems. "Bechtel does not want to get involved in products that may require additional software coding," Howard says. "We also do not want to be involved in maintaining these products."

Howard says that Bechtel does support the industry standards to the extent that they are realistically available. "We are strong supporters of international standards, but we can't be spending a lot of our resources in helping vendors develop and refine their standards-based products," he says.

Seamless service

An early supporter of the standards-based approach was Pacific Bell, a Bell operating company headquartered in San Francisco. Early on, Pacific Bell chose the E-mail backbone approach with the intention of providing a standards-based platform on which the backbone would reside. Working closely with DEC, Pacific Bell began to build its backbone using the Mailbus products.

Speaking at the EMA conference, Lee Camp, vice-president of information services for Pacific Bell, told attendees that one of the BOC's priorities is to offer an E-mail service that will provide "user-charming," or seamless, service to customers.

The company could not provide its new Pacific Bell Connection electronic message-handling service without a standards-based architecture. This is of critical importance to Pacific Bell because the company believes it can serve a majority of local users and businesses by providing a variety of system interconnection capabilities.

This type of architecture may also place Pacific Bell in a position to capture a significant amount of the EDI market.

According to Camp, future directions for Pacific Bell include alternative message delivery options such as printed copy delivery and direct delivery to facsimile machines, as well as integration of voice, text and graphics into the connection service. The company is also considering moving into the EDI market.

Conclusion

Major benefits will accrue to users that take a well-thought-out approach to connecting disparate E-mail systems. A fully integrated, standards-based E-mail system will allow a worldwide company to function as a single enterprise.

With such a system, quick and transparent mixed-media information exchange throughout a corporation — as well as to its external customer base — will soon become a reality.

Companies seeking to use information systems to gain a competitive edge through efficient connections to the outside world should weigh their tactical and strategic approaches carefully while focusing on business needs and objectives.

They should also keep in mind that building an information backbone network designed to integrate multivendor networking and messaging environments is no easy task.

According to Gartner Group's Wendler, companies will need to begin building their standards-based networks before 1992. These networks should proceed as pilot tests, Wendler says, until the standards and products have stabilized, which may not be until 1993. Or, for the interim, he suggests, companies can go with a public X.400-based E-mail service such as Dialcom and wait out the pilot- and conformance-testing periods.

Building enterprisewide communications networks will require creative thinking, judicious planning and sufficient technical expertise; it will also require skillful management teams that are willing to take risks, provide strong leadership and promote a vision for the future.

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CONTINUED FROM PAGE 1

been overcome. Much has been accomplished, but much remains to be done.

E-mail flavors

Public E-mail services furnish public electronic mailboxes in which subscribers can deposit and receive mail. Private E-mail networks use either a local network server or a host computer as the central point for functions such as establishing mailboxes, granting access, controlling message flow and correcting errors.

With either approach, users can create, send, receive, forward, print or file messages using a dumb terminal or personal computer. Some systems even allow users to append existing files, such as spreadsheets, to E-mail messages.

Others go a step further by converting messages to a CCITT Group III-compliant facsimile format and then forwarding them to a facsimile machine.

All of the services listed in the "Electronic mail service providers" chart on page 36 as providing facsimile transmission can send a CCITT Group III facsimile message to a user's location, but the user must have a facsimile machine or personal computer facsimile board to receive it. No currently available E-mail product, and only one public E-mail service, will allow a user who does not have a facsimile machine to receive a facsimile message.

The exception is Xpedite Systems, Inc.'s Xpedite Service, which can convert a facsimile message to a bit-mapped format and send it to either a user's facsimile machine or personal computer. However, the data received on the personal computer can only be printed out; it cannot be displayed on the screen.

According to Xpedite President Roy Anderson, "All the user needs is a PC to generate the message and a Hewlett-Packard [Co.] or Epson [America, Inc.] printer to receive it." Xpedite has personal computer facsimile cards at its locations that can convert a sender's ASCII text message to facsimile format.

Xpedite Service is the only E-mail service covered in this survey that handles incoming and outgoing facsimile messages, regardless of the graphics content. "That's significant, since most PC fax boards have problems with different type fonts, such as those found on the fax routing sheets [that accompany transmissions]," says Eric Arnum, editor of New Canaan, Conn.-based International Resource Development Corp.'s "Electronic Mail and Micro Systems" newsletter.

According to Arnum, most E-mail services that offer a facsimile forwarding service use personal computer facsimile cards to handle data conversion, and that's fine as long as they're converting ASCII messages into facsimile format.

But when someone sends a facsimile message into the E-mail system, the conversion from facsimile format to ASCII or some other format that the personal computer can handle is not so easy. The facsimile card's optical character recognition (OCR) software cannot handle all the different type fonts that exist, and it can't read handwritten copy.

Anderson says Xpedite solves that problem by not employing OCR to handle the transmitted data. "We bit-map everything and create a [tag image format file]-formatted image print file that's sent to the [recipient's] hard disk," he says. (Tag image format file, or TIFF, is a common format used for transmitting image files to personal computers.) Currently, Anderson notes, Xpedite's TIFF-formatted images can only be printed out and cannot be displayed on the user's personal computer screen.

One problem with using TIFF is that bit-mapped files take up a lot of disk storage space. Therefore, the Xpedite approach is best for users who send many facsimile messages but do not receive large numbers of them. Users who receive large numbers of facsimile messages would be better off using a conventional facsimile machine, instead of a personal computer, as the receiver.

Conversely, one of the advantages to Xpedite Service is that it is more efficient than conventional facsimile for transmitting messages to a large number of locations. The customer merely transmits the distribution list and the message via modem, using an 800 number, to the Xpedite location. Xpedite Service does the conversion and routing. Given that the average facsimile page needs 40 seconds for transmission, it saves a lot of time.

The new MCI Communications Corp. facsimile service, which

(continued on page 36)

Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

NETWORK WORLD

Electronic mail service providers

Vendor	Service name	Connection services	Message-waiting alert	User interface	Distribution lists	Modem speeds (bit/sec)/ protocol	Facsimile forwarding	Binary files transferred	Subscription fee per user	Communications software fee	Connect time charge	Charge for characters transmitted	Print copy delivery charge
AT&T **Morristown, N.J.**	AT&T Mail	IBM PROFS; AT&T's MailFax, MailPrint, ADMD X.400, PRMD X.400, Mailtalk; X.25; telex	✓ (through AT&T Mail)	Menus	✓	Up to 9.6K/ XModem	✓	✓	$30 per year	$100	Free 800 service	40 cents (400 characters or less); 80 cents (401 to 7,500 characters); 80 cents for each additional character	U.S. mail $2.00 for first 7,500 characters or less; $27.50 for same day service (7,500 characters or less); 95 cents per minute for telex (400 characters or less); 45 cents for MailPrint (1,500 characters or less)
CompuServe, Inc. **Columbus, Ohio**	EasyPlex	MCI Mail; IBM PROFS; telex	✓	Menus, commands		Up to 2,400/ XModem, Kermit, proprietary	✓	✓	$39.95	Not applicable (works with any software)	$6 per hour for 300 bit/sec; $12 per hour for 1,200 or 2,400 bit/sec	None	Not offered
Computer Sciences Corp./Infonet **El Segundo, Calif.**	Notice International Electronic Messaging	X.400; telex		Menus, commands	✓	2,400/any		✓	$1,000 minimum	$100 to $125	$15 per hour for asynchronous, BSC, X.25	15 cents per 1,000 characters	U.S. mail $1.50 for first page; $1.00 for pages 2 to 5
Dialcom, Inc. **Reston, Va.**	EMAIL	IBM PROFS; Wang Laboratories, Inc. Wang Office; X.400	✓	Menus, commands	✓	Up to 2,400/ XModem, YModem, Kermit	✓	✓	$25 per mailbox; no charge for usage of $500 per month or more	Not applicable (works with any software)	$14 per hour from 8 a.m. to 6 p.m.; $6.50 per hour 6 p.m. to 8 a.m.	5 cents per 1,000 characters	20 cents per page to print; distribution based on cost plus 20%
McDonnell Douglas Network Systems Co. **San Jose, Calif.**	OnTyme Plus	IBM PROFS; DA Systems, Inc.'s DASNet; telex		Pop-up menus, commands	✓	Up to 9.6K/ XModem, Kermit, Hayes Microcomputer Products, Inc. Smartcomm, proprietary		✓	$300 per month per user	$95 per user	$4.50 per hour 6 a.m to 6 p.m.; $3.00 per hour 6 p.m to 6 a.m.	25 cents per 1,000 characters 6 a.m. to 6 p.m.; 23 cents per 1,000 characters 6 p.m. to 6 a.m.	Not offered
MCI Communications Corp. **Washington, D.C.**	MCI Mail	CompuServe, Inc.'s CompuServe; facsimile; telex	✓	Menus	✓	Up to 1,200/X.PC	✓	✓	$25 per year			45 cents for up to 500 characters; $1.00 for 501 to 7,500 characters; $1.00 for each additional 500 characters	Domestic: $2.00 for first 3 pages, $1.00 for each additional 3 pages; Courier: $9.00 for first 6 pages, $1.00 for additional 3 pages; International delivery available
Telenet Communications Corp. **Reston, Va.**	Telemail	Dow Jones Information Service Group's News/Retrieval service, X.400, X.12, OSI	✓	Menus, pop-up menus, commands	✓	Up to 9.6K/ XModem, YModem, proprietary	✓	✓	Low usage: $15 plus $20 per month minimum usage; corporate: $140 plus $500 per month minimum usage	Low usage: $150; corporate: $135	$14 per hour 7 a.m. to 6 p.m.; $7 per hour 6 p.m. to 9 p.m.; $4 per hour 9 p.m. to 7 a.m.	5 cents per 1,000 characters	$1.40 for first page and 22 cents for each additional page; telex delivery also available
Western Union Corp. **Upper Saddle River, N.J.**	Easylink	Easylink International in UK; Digital Equipment Corp.'s All-in-1; Wang Office; IBM PROFS, DISOSS; telex		Menus	✓	Up to 2,400/ proprietary	✓	✓	None; $25 minimum monthly charge	$195	None; charges are based on message traffic	45 cents for 2,500 characters at 1,200 bit/sec 7 a.m. to midnight; 40% discount until 7 a.m.	Mailgram: $3.95 for 1,250 characters or less and 50 cents for each additional 1,250 characters; Priority letter: $1.50 for first page, 50 cents for each additional page
Xpedite Systems, Inc. **Eatown, N.J.**	Xpedite Service	Any Group III facsimile and telex	✓	Menus	Unlimited	1,200 or 2,400/ ZModem	Forward and receive	✓	$10 per month minimum plus $2 per user up to $50 maximum	$49	12½ cents per minute; 60 to 90 cents per minute for data transfer services	Not applicable	Not offered

BSC = Binary Synchronous Communications
OSI = Open Systems Interconnection
PROFS = IBM's Professional Office System

This chart includes only a representative selection of E-mail service providers. Most vendors offer other services, and many vendors not included manufacture a full range of competitive services. Information for GE Information Services could not be obtained by press time.

SOURCE: TMS CORP., DEVON, PA.

(continued from page 35)

was announced on Nov. 3, will also permit personal computer users to send a facsimile message anywhere within the MCI network, but no provision exists to enable a personal computer user to receive a facsimile message through MCI Mail.

According to an MCI spokesman, MCI Fax will also accommodate standard Group III facsimile transceivers. Messages can be both sent and received over that network.

MCI also permits MCI Fax to be integrated with its MCI Mail service to allow customers to establish mailboxes.

Sending and receiving

On all E-mail systems, customers are assigned a mailbox with some form of identification and site location. This is used by the routing or switching portion of the system to deliver the message. With most E-mail systems, it's unnecessary to know the end user's address since that's contained in the network directory. The sender simply enters the recipient's name — or in some cases an alias — and the system looks up the location in the directory.

All E-mail systems and services in this Buyer's Guide support distribution lists. These lists permit the owner to group certain recipients together and transmit a message to all by entering the list designation. Just about all systems, according to the vendors, allow an unlimited number of distribution lists and members in the list (see the "Local net-based electronic mail systems" chart on page 46 and the "Host-based electronic mail systems" chart on page 48). In actuality, the number is determined by the amount of disk storage devoted to lists.

Another feature of most E-mail systems is the ability to generate carbon copies of messages, and some offer blind carbon copies (that is, the primary recipient is unaware that the copy is being generated). Some vendors are at odds regarding the validity of the latter since the same type of confidentiality can be obtained by putting those messages normally copied into a different distribution list.

The message distribution directory, as was noted, contains the names and locations of all boxholders on the network. Since many E-mail systems also permit multiple networks to be connected, the task of maintaining networkwide directories is of some concern.

Managing such directories is a painstaking task, regardless of what vendors say. Boxholders are added, deleted, moved permanently or temporarily, and some have multiple locations. Therefore, users should determine how much of the directory updating is

(continued on page 45)

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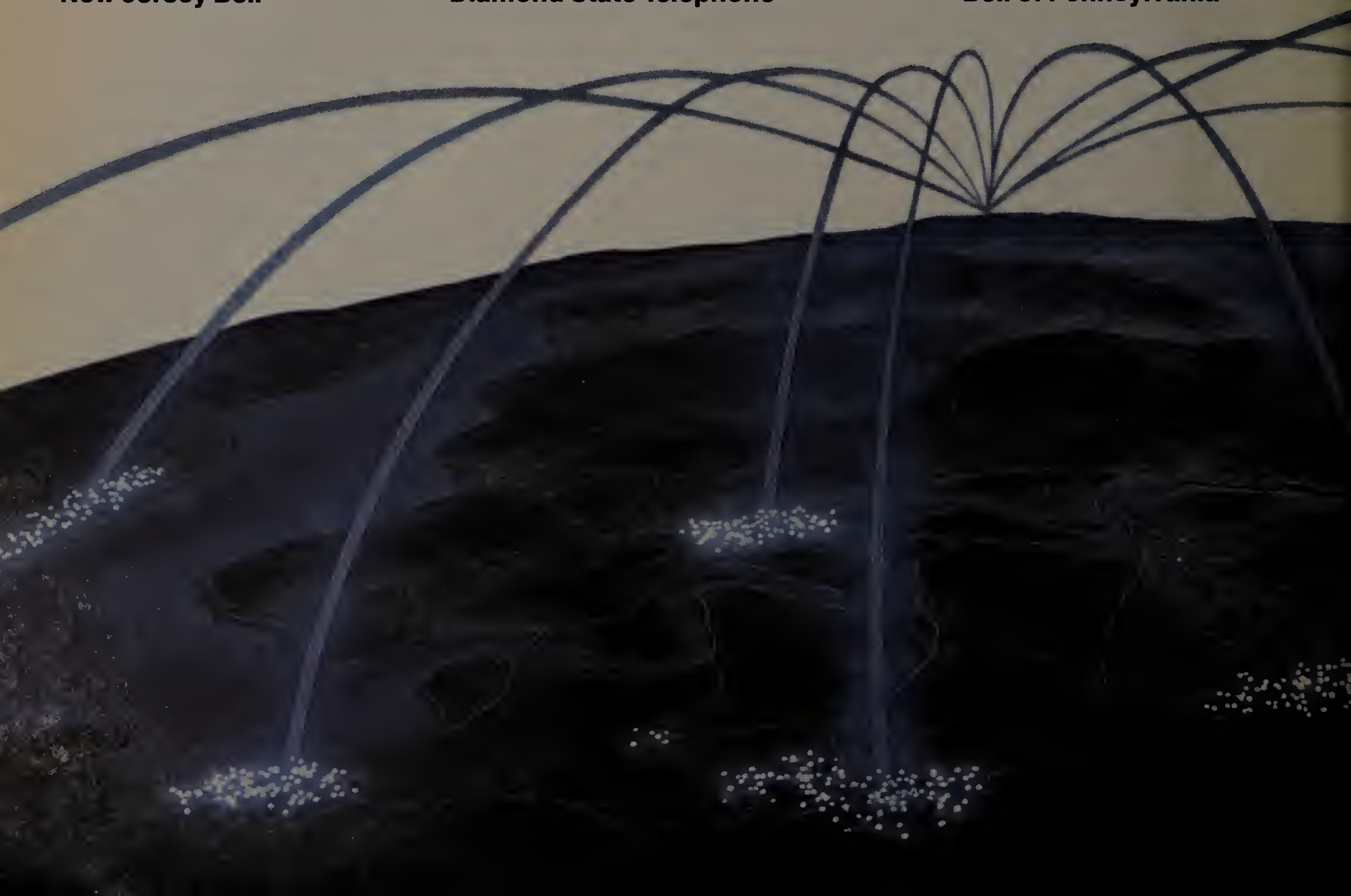

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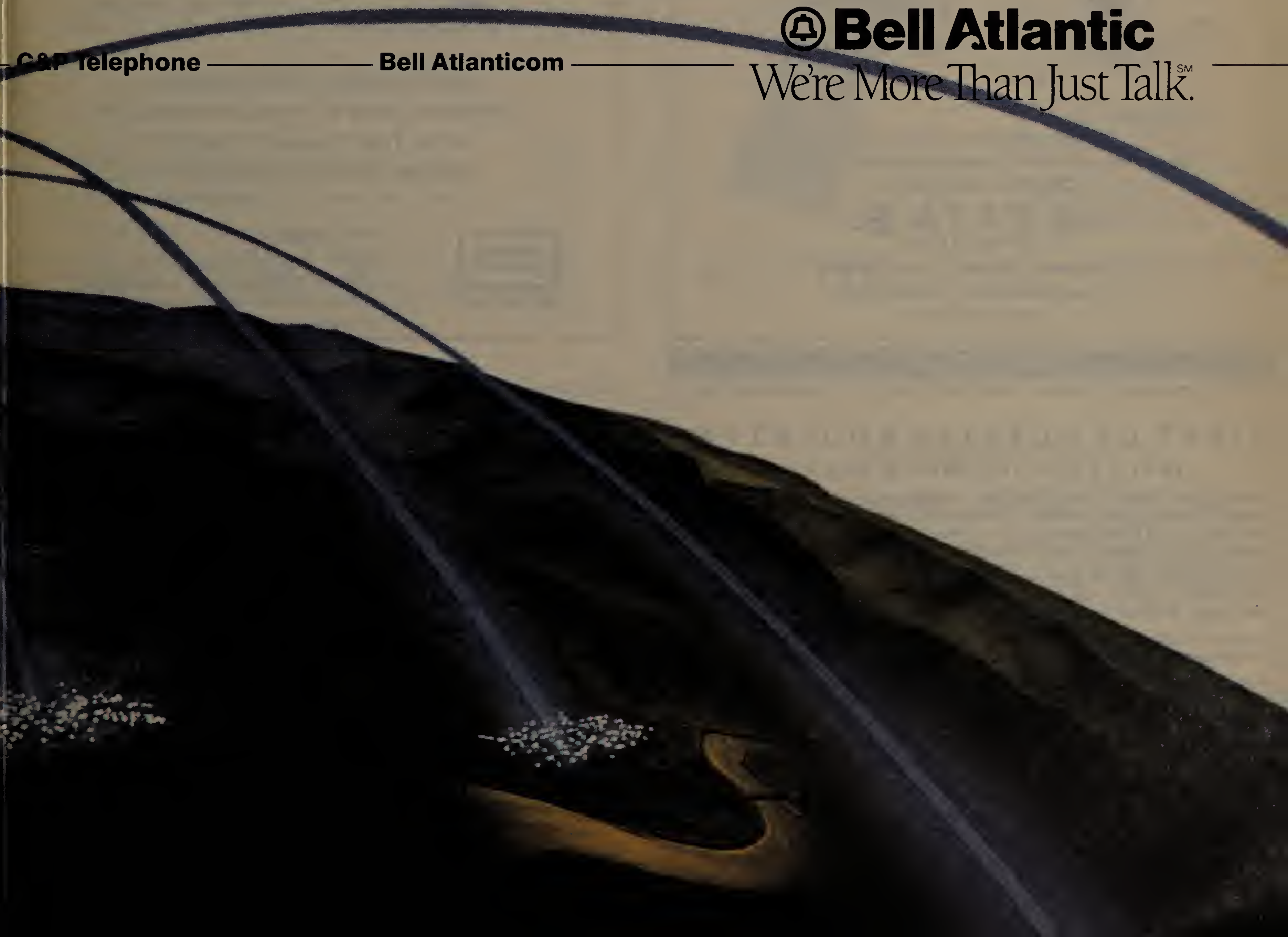

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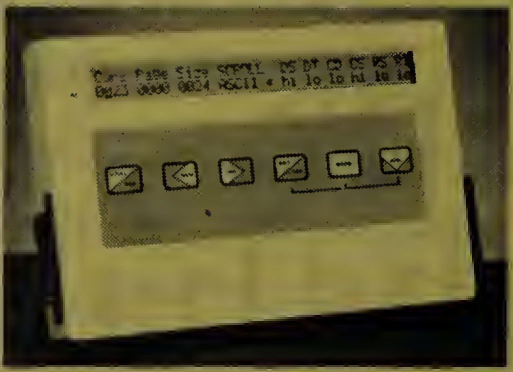

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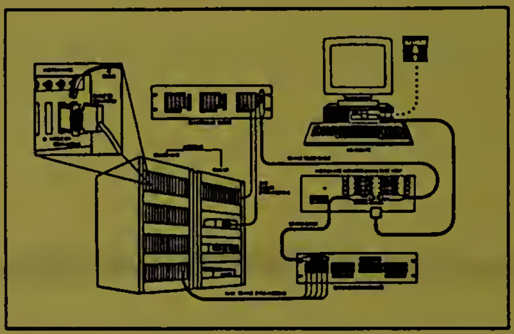

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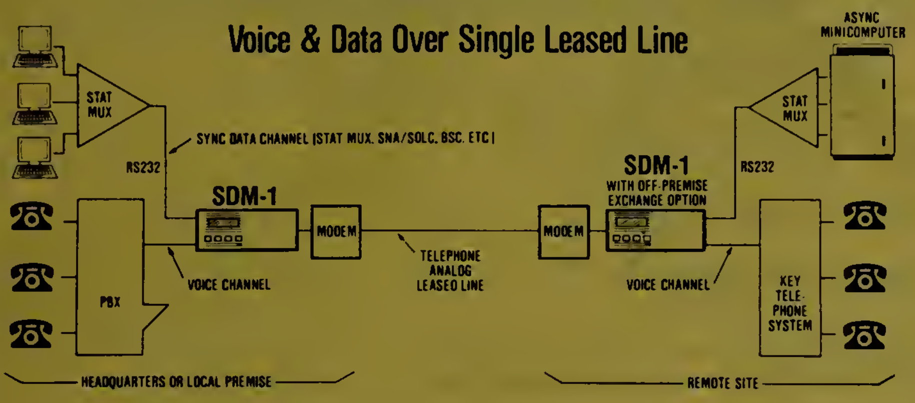
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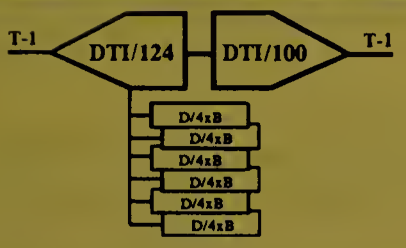

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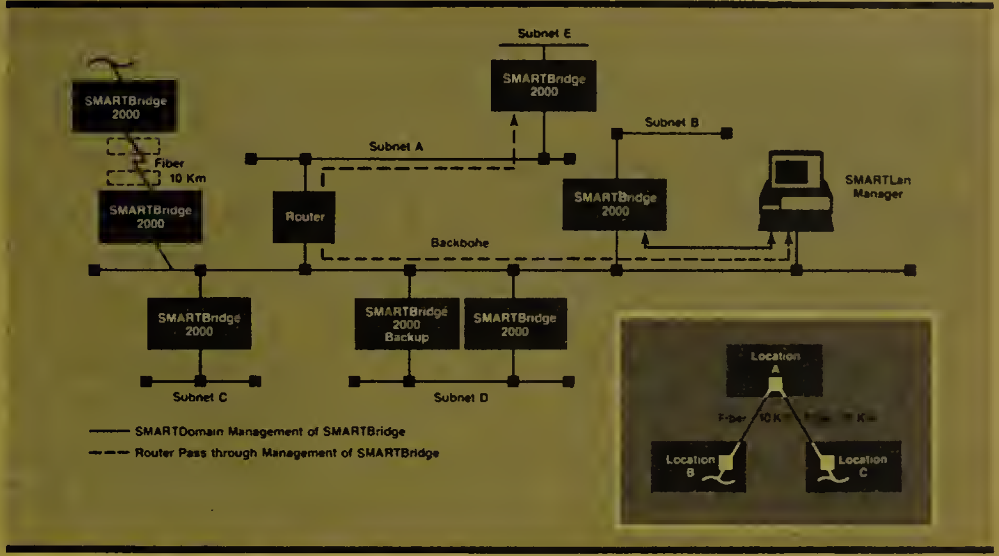

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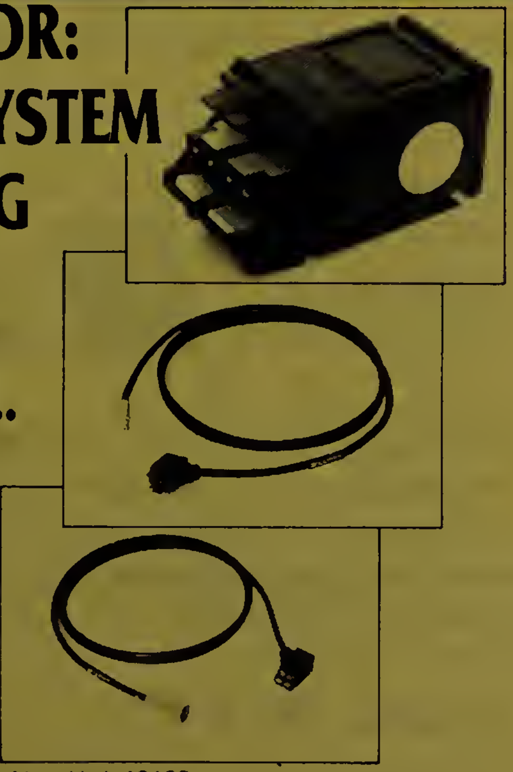

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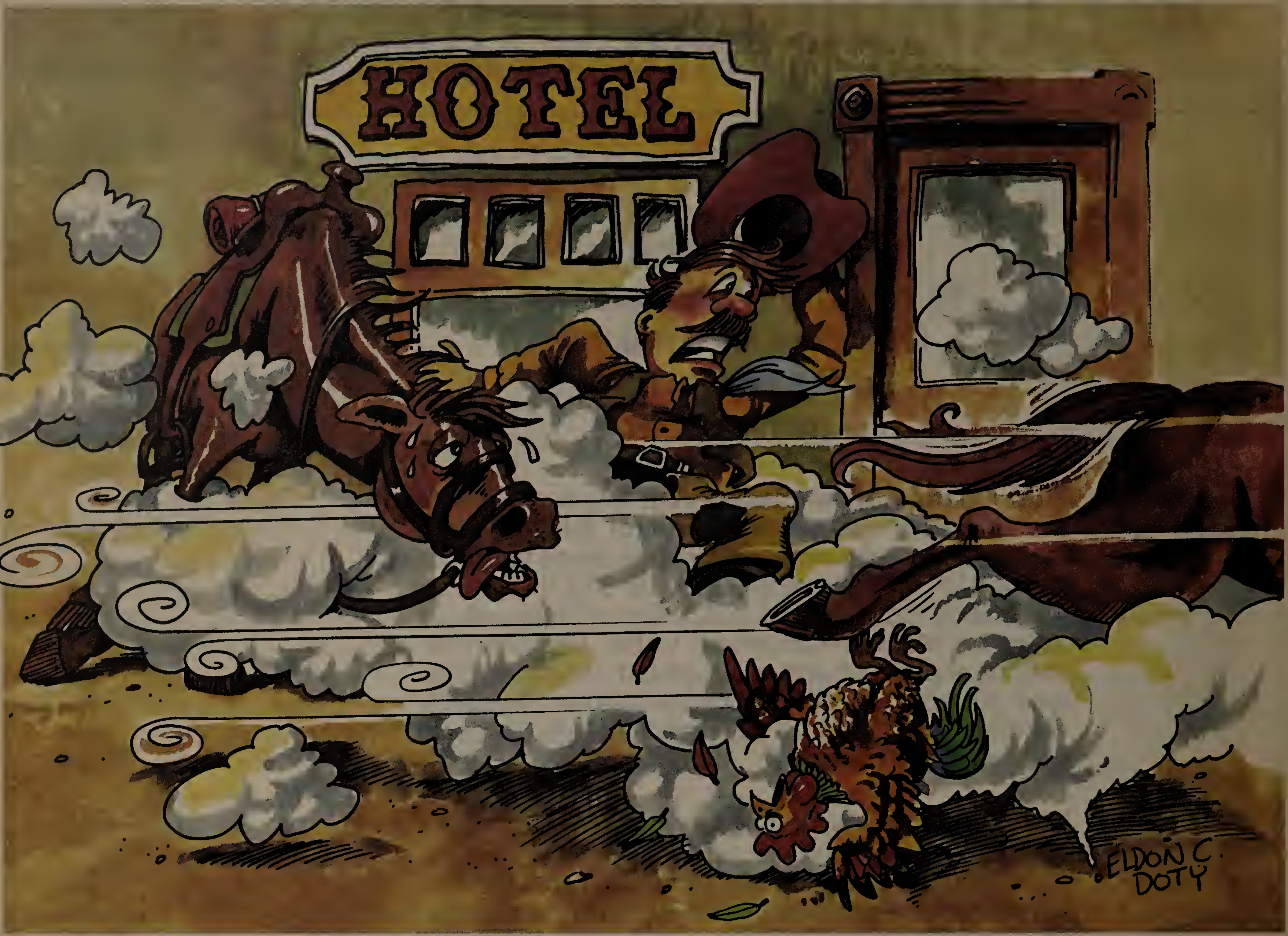

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(continued from page 36)

handled automatically.

Some vendors claim the updating task is almost fully automated, and they tend to minimize what the user company's systems administrator has to do. That, however, could result in an unpleasant surprise.

Many E-mail systems offer a word-processing facility that lets users compose, edit and alter messages.

▲▲▲

"The job of keeping directories current is a housekeeping task that involves lots of detail," says Walter Ulrich, a partner in the firm of Coopers & Lybrand in Houston and an E-mail expert.

He cautions that companies considering linking different systems together should take a close look at what the systems administrator has to do to keep the directory current since updating gets very complex when a variety of different systems are involved.

With X.400-compliant networks, that task will be simplified once the CCITT-sponsored X.500 directory guidelines are adopted. But that could be a while yet. While X.500 is expected to be adopted for X.400 by the end of 1988, it is not expected to be implemented on a wide scale until late 1989.

Enhanced services

The message-handling capabilities of E-mail systems have come a long way in the past couple of years. Initially, they concentrated on transmitting short messages, such as memos, reminders, immediate action notes and the like. Now, just about all permit existing files such as spreadsheets and word-processing text files to be attached to the message. None, however, can transmit an image of an actual document.

Another enhancement offered by many E-mail systems is a rudimentary word-processing facility that permits users to compose, edit and alter messages. It's certainly not perfect, but it's sufficient for the purpose.

When messages are composed, the initiator can designate whether delivery should be immediate or deferred, relying on the system's store-and-forward facilities to schedule delivery.

If a personal computer is used as the terminal, the messages can be delivered in background mode without interrupting regular processing. The method of notifying recipients that mail is waiting varies, but many systems employ a blinking character or symbol. Some public E-mail services do not furnish any indication but require the subscriber to call in to the E-mail service.

Remote boxholders

The public services and most of the private E-mail systems permit remote users to dial in and send and receive mail. To do so, however, the personal computer must be loaded with communications software furnished by the E-mail vendor. Simplicity of interaction is important to users, and most vendors have responded with pop-up, pull-down and general menus.

The public services providers charge for terminal connect time, and these charges can mount quickly if all messages are composed on-line. Smart users recognize that an easy way to minimize communications costs is to compose all messages off-line on their personal computers and transmit them in block mode.

For users who require hard copies of their messages, most of the public services also offer a variety of delivery options ranging from conventional postal services to courier services. A few public services even have international delivery.

Gateways

As the E-mail service providers chart beginning on page 46 illustrates, many services support connections to diverse E-mail systems. Some of the more popular ones are IBM's Professional Office System (PROFS) and DISOSS, DEC's All-In-1 and Wang Laboratories, Inc.'s Wang Office. Some private systems also have gateways to public E-mail services such as AT&T Mail, MCI Mail and Western Union Easylink to further extend their overall network reach.

Another gateway gaining acceptance is X.400. A CCITT standard for the interconnection of dissimilar E-mail systems, X.400 specifies a set of protocols for transmitting messages and implementing message-related services over public and private networks.

The public services providers charge for terminal connect time, and these charges can mount quickly.

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X.400 works with the International Standards Organization's Opens System Interconnection model for communication networks and is designed to operate with the session layer (Layer 5 of the OSI model). It also provides a set of protocols for use in the presentation and application layers (Layers 6 and 7). Therefore, any two systems supporting X.400 and having session-level connectivity should be able to exchange messages.

It's a little early to say how successful X.400 will be, since only a few services have implemented it. However, unless the communicating systems adopt the same X.400 features, they will not be 100% compatible.

Most of the gateways available are 1-to-1 affairs. For example, the gateway will have the facilities necessary to convert the protocol and message formatting from, say, All-In-1 to PROFS. Therefore, companies needing multiple connectivity must be prepared to bear the cost of different gateways, and that can be quite a price shock.

"A gateway between X.400 and All-In-1 involving a [DEC] MicroVAX can cost up to $50,000 for the hardware and software," says Karl Presser, chief operating officer for CC:Mail, Inc. in Palo Alto, Calif.

Actually, that price is a bargain since two leading X.400 software packages on the market for private networks, the Retix X.400 Message Handling System and Sydney's Messenger 400, sell for $137,000 and $35,000, respectively, with gateways extra ("Two X.400 E-mail handlers," *NW,* Aug. 29).

A more cost-effective way to reach multiple diverse E-mail systems is to pass messages to one of the public services; however, as the charts show, their gateways are somewhat limited. One company claiming to offer more extensive connectivity is DA Systems, Inc. of Campbell, Calif., through its DASnet.

According to a DA Systems spokeswoman, DASnet "allows the exchange of messages between users of the major U.S.

(contined on page 47)

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NETWORK WORLD

Local net-based electronic mail systems

Vendor	Product	LAN operating system	PC operating system	Distribution lists per system/ boxholder	Number of members per distribution list	Network-wide directories	User interface	Number of existing files attachable	File types supported	Word processing included	X.400-compatible	External gateways	Facsimile forwarding	Dial-up speeds (bit/sec)/ protocols	Price per license
Action Technologies, Inc. **Emeryville, Calif.**	Coordinator	NetWare, 3+, VINES, PC LAN	MS-DOS 3.0 and above	Unlimited/ unlimited	Unlimited	✓	Pull-down menus	1	Binary, text, graphics	✓		PROFS, DISOSS, All-In-1, VMS Mail, Wang Office, HP Desk, CompuServe, telex, Infoplex, facsimile	✓	Up to 2,400/ proprietary	$995 for 10 users; $1,995 for 30 users; $495 for remote users
Apollo Computer, Inc. **Chelmsford, Mass.**	DPSS	NA	NA	Unlimited/ unlimited	2,000	✓	Pop-up menus, command line	Unlimited	Text					Up to 64K/NA	NA
Ashton-Tate Corp. **Torrance, Calif.**	Framework III	NetWare, 3+, PC LAN, Starlan	MS-DOS 2.0 and above	Unlimited/ unlimited	Unlimited	Only with Message Handling System	Pull-down menus	1	Binary, text, graphics	✓		MCI Mail		Up to 2,400/ Kermit, XModem, YModem, Crosstalk, Smart-comm	$995 per 5 users
AT&T **Morristown, N.J.**	PMX/ StarMail	Starlan, 3+, PC LAN, 10 NET/Plus, MS-DOS 3.X/ NETBIOS	MS-DOS 2.X	Unlimited/ unlimited	200	✓	Function keys, pop-up menus	99	Binary, text, graphics, voice	✓	✓	AT&T Mail, Wang Office, OIS/VS, HP Desk, All-In-1	✓	Up to 19.2K/ XModem, YModem, YModem 251, proprietary	$995 to $6,000
Banyan Systems, Inc. **Westborough, Mass.**	Network Mail	VINES	MS-DOS 2.X	Unlimited/ unlimited	Unlimited	✓	Menus	10	Binary, text, graphics	✓		Third-party products	✓	Up to 9.6K/ Kermit	$995
CC:Mail, Inc. **Palo Alto, Calif.**	CC:Mail LAN Package	MS-DOS 3.1 or equivalent	MS-DOS 3.1 and OS/2	200/200	200	✓	Menus; pop-up menus optional	20	Binary, text, graphics	✓		PROFS, Easylink, Telemail		Up to 19.2K/ proprietary	$695 per seven users
Conetic Systems, Inc. **San Leandro, Calif.**	Higgins LAN Server Kit	Any MS-DOS 3.1 or equivalent	MS-DOS 3.1 and higher; OS/2	Unlimited/ unlimited	Unlimited	✓	Menus	27	Binary, text, graphics	✓		3+ Mail, PROFS, DISOSS, All-In-1, DEC Mail, Wang Office, MCI Mail	✓	1,200, 2,400, 9.6K/ proprietary	$995 for 20 users
Consumers Software, Inc. **Bellingham, Wash.**	The Network Courier	NetWare, VINES, 3+, 3+Open, Net/One	MS-DOS 3.X	Unlimited/ unlimited	Unlimited	✓	Commands; pop-up menus optional	Unlimited	Binary, text, graphics	✓	✓	MCI Mail, PROFS, All-In-1, VAX Mail		Up to 9.6K/X.PC	$295 to $995 per user
Datapoint Corp. **San Antonio, Texas**	Vista-Mail	RMS or Arcnet	MS-DOS	Unlimited/ unlimited	Unlimited	✓	Menus	Unlimited	Binary, text, graphics	✓		DISOSS, telex, Teletex		Up to 19.2K/ XModem	$500 for a single user; $12,500 for unlimited users; $2,500 for host software needed to serve 255 users
Digital Equipment Corp. **Maynard, Mass.**	PC LAN/Server 2000 PCMail	VMS	MS-DOS or equivalent	Unlimited/ unlimited	Unlimited	✓	Pull-down menus	1	Text	✓	✓	MCI Mail, VMS Mail, SNADS, PROFS		Up to 19.2K/NA	$18,000 for total hardware and software
Harris Corp. **Lanier Voice Products Division** **Atlanta**	Lanier Mail	Xenix or Lanier Network Services	MS-DOS	Unlimited/ unlimited	42	✓	Menus	1	Binary, text, graphics	✓		DISOSS, PROFS, Xenix/Unix Mail		300 to 9.6K/ Kermit	$1,995 for unlimited users
Honeywell Bull, Inc. **Waltham, Mass.**	ONEMail (part of One Plus Integrated Office System)	MS-Net	MS-DOS	Unlimited/ unlimited	Unlimited	✓	Menus	Unlimited	Binary, text, graphics	✓	✓	DISOSS		Up to 9.6K/ Kermit	$450 to $1,350
Retix **Santa Monica, Calif**	RetixMail	Any	MS-DOS 3.X	32,000/ 32,000	32,000		Menus, Microsoft Corp. Windows	Unlimited	Binary, text	Text editor	✓	X.400	✓	Up to 64K (via X.25 board)/ X.400, X.25	$7,000 for 100 users
Sydney Development Corp. **Vancouver**	Messenger 400	NetWare	MS-DOS	Unlimited/ unlimited	Unlimited	✓	Menus, commands	Unlimited	Binary, text	✓	✓	Unix Mail, ARPA Mail, AT&T Mail, Telemail, PROFS, Dialcom	✓	Up to 9.6K/NA	$400 to $35,000
3Com Corp. **Santa Clara, Calif.**	3+ Mail for PC	3+ Version 1.2 and above	MS-DOS 3.X	Unlimited/ no lists for boxholders	Unlimited	✓	Pull-down menus, command lines, function keys	25	Binary, text, graphics	✓		MCI Mail, PROFS, SNADS, Easylink via third-party products	Outbound only	Up to 9.6K/ proprietary	$595 for up to 5 users; $1,190 for unlimited users
	3+ Mail for MAC	3+ for Macintosh	Macintosh	Unlimited/ no lists for boxholders	Unlimited	✓	Pull-down menus, icons, mouse, function keys	25	Binary, text, graphics	✓		MCI Mail, PROFS, SNADS, Easylink via third-party products	Outbound only	None offered	$595 for up to 5 users; $1,190 for unlimited users

All-In-1 = Digital Equipment Corp. office and information system
Arcnet = Datapoint Corp. operating system
ARPA Mail = Advanced Research Projects Agency E-mail
AT&T Mail = AT&T E-mail
Crosstalk = Crosstalk Communications software
CompuServe = CompuServe, Inc. service
DEC Mail = DEC E-mail
Dialcom = Dialcom, Inc. service
Easylink = Western Union Corp. service
HP Desk = Hewlett-Packard Co. E-mail
Infoplex = CompuServe, Inc. service
MCI Mail = MCI Communications Corp. E-mail
NA = Information not available
NETBIOS = IBM's Network Basic I/O System
Net/One = Ungermann-Bass, Inc. operating system
NetWare = Novell, Inc. operating system
OIS/VS = Wang Laboratories, Inc. E-mail
PC LAN = IBM operating system
PROFS = IBM's Professional Office System
RMS = Datapoint Corp. operating system
Smartcomm = Hayes Microcomputer Products, Inc. E-mail
SNADS = SNA Distribution Services
Starlan = AT&T network
Telemail = Telenet Communications Corp. service
10NET/Plus = 10NET Communications network
3+ = 3Com Corp. operating system
3+Mail = 3Com E-mail
3+Share = 3Com E-mail
VAX Mail = DEC E-mail
VINES = Banyan Systems, Inc. operating system
VMS Mail = DEC E-mail
Wang Office = Wang Laboratories, Inc. E-mail

This chart includes a representative selection of vendors in the local net-based E-mail system market. Most vendors produce other systems, and many vendors not included manufacture a full range of competitive products. Information for IBM could not be obtained by press time.

(continued from page 45)

public E-mail services."

Among those listed by the company are AT&T Mail, Dialcom, Inc.'s Dialcom, Easylink, Telenet Communications Corp.'s Telemail, GeoMail and PeaceNet. GeoMail is owned by the worldwide GeoMail Association of System Operators, while PeaceNet belongs to the Institute for Global Communications. DA Systems also has gateways to several private systems, including DEC's VAX Mail and HP's HP Desk.

Jim Taylor chose DASnet for its ability to communicate with different E-mail services.

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The ability to communicate with different E-mail services prompted Jim Taylor, an account representative with the Graphics Arts Center, Inc., a major printer in Portland, Ore., to use DASnet.

"I've been a longtime customer of MCI Mail, but many of my customers are using somebody else," he says. "With DASnet, I can reach many of them." Taylor uses E-mail to transmit messages, contract information and bids, and he feels it's superior to facsimile in getting user attention.

"There's nothing like entering a message directly into the computer to get someone's attention," Taylor says.

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"With fax, messages often pile up in the fax room and are delivered late," he says. "There's nothing like entering a message directly into the computer to get someone's attention."

What's ahead

E-mail and its cousin, voice messaging, are tools designed to increase the productivity of all using them. The current E-mail systems and services do a commendable job of sending and receiving short messages, and some have extended their reach by supporting outgoing facsimile.

None, however, except the AT&T PMX Terminal and PMX/PC, both of which support ANSI X.12, offer document interchange other than transferring files such as spreadsheets.

HP's DeskManager also supports X.12. As was mentioned earlier, CCITT is looking to integrate electronic data interchange (EDI) into X.400, but that effort is only in the discussion stage.

For those needing EDI today, it's offered on specialized networks from General Electric Co., McDonnell Douglas Network Systems Co., AT&T and Telenet. EDI, however, is not a universal specification like X.400.

Instead, those companies wishing to exchange documents must convert them to comply with a mutually agreed-upon transmission standard and then reconvert the received document to a form their own systems recognize. ANSI X.12 is such a standard, but not everyone wants to use it.

As for the X.400/EDI union, that might happen eventually. But for now, they're just strangers in the night.

NETWORK WORLD

Local net-based electronic mail systems (continued)

Vendor	Product	LAN operating system	PC operating system	Distribution lists per system/ boxholder	Number of members per distribution list	Network-wide directories	User interface	Number of existing files attachable	File types supported	Word processing included	X.400-compatible	External gateways	Facsimile forwarding	Dial-up speeds (bit/sec)/ protocols	Price per license
Torus Systems, Inc. Redwood City, Calif.	Tapestry II/LAN Manager	Tapestry II	MS-DOS 3.X	65,536/ 65,536	65,536	✓	Icons	1	Binary, text, graphics	✓				300, 1,200, 2,400/ proprietary	$2,995 for 8 users
	Tapestry/8	Tapestry/8	MS-DOS 3.X	400/4	100	✓	Icons	1	Binary, text, graphics	✓				300, 1,200, 2,400/ proprietary	$795 for 8 users
Wang Laboratories, Inc. Lowell, Mass.	LAN Office 1.0	VINES, NetWare, 3+, 3+ Share, IBM PC LAN	MS-DOS 3.2 and higher	1	30	✓	Menus, function keys	10	Binary, text, graphics	Text editor		Through Wang Office only	Through Wang Office only	Not supported	$795 per server

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See us on page 51

NETWORK WORLD

Host-based electronic mail systems

Vendor	Product	Host computer/ operating system	PC operating system	Random-access memory required	Number of distribution lists per system/ boxholder	Members per list	Network-wide directories	User interface	Number of existing files attachable	File types supported	Word processing provided	X.400 compatibility	External gateways	Dial-up speeds/ protocols	Facsimile forwarding	Price per license
AT&T Morristown, N.J.	AT&T Mail PMX Terminal and PMX/PC	Any/Unix System V	MS-DOS	2M bytes on host; 380K on PC (165K RAM resident)	Unlimited/ unlimited	200	✓	Function keys, pop-up menus	99	Binary, text, graphics, voice	✓	✓	AT&T Mail; PROFS; DISOSS; All-In-1; DEC Mail; VMS Mail; HP Desk; Wang Office; OIS/VS	Up to 19.2K/ XModem, YModem 251; AT&T proprietary	✓	$995 to $6,000
Coker Electronics San Mateo, Calif.	tPOST	IBM Personal Computer XT, AT, Personal System/2/ MS-DOS	MS-DOS 2.X	320K minimum; 512K recommended	Unlimited/ unlimited	200		Menus	2	Binary, text, graphics	Text editor			Up to 2,400/ XModem	✓	$229 for host; $129 for first PC; $99 for 2 or more PCs; $129 for facsimile forwarding
Computer Applications Services, Inc. Irvine, Calif.	EMS	Any IBM/MVS, DOS, VSE	MS-DOS	NA	Unlimited/ unlimited	300	✓	Command line, function keys		Not applicable	Text editor		Easylink; Graphnet; ITT; IBM LU 6.2		Up to 19.2K/NA	$11,000; $4,500 for gateways
Computer Consoles, Inc. Irvine, Calif.	Office Power	CCI Power/ Unix System V	Not supported	8M bytes	Unlimited/ unlimited	Unlimited	✓	Menus, commands	1	Binary, text, graphics	✓		Unix Mail; telex	Up to 9.6K/ proprietary		$2,000 1 to 4 users; $40,000 unlimited users
Datapoint Corp. San Antonio, Texas	Vista-Mail	Datapoint 7XXX, 8XXX/RMS	MS-DOS	408K bytes; 640K on PC	Unlimited/ unlimited	Unlimited	✓	Menus	Unlimited	Binary, text, graphics	Text editor		DISOSS; Telex; Teletex	Up to 19.2K/ XModem		$2,500 plus $500 per subscriber or $12,500 for unlimited users
Digital Equipment Corp. Maynard, Mass.	All-In-1	VAX/VMS	NA; requires DEC VT-100	NA	Unlimited/ unlimited	Unlimited	✓	Menus, command lines	Unlimited	Text, graphics	✓	✓	MCI Mail; PROFS; PS; DISOSS		Not applicable	$2,450 for starter version; $78,750 to $112,219 for VAX 8978; $7,088 for MicroVAX
H & W Computer Systems, Inc. Boise, Idaho	SYSM and SYSM/PC	Any IBM/MVS	MS-DOS	256K bytes	Unlimited/ unlimited	Unlimited	✓	Menus, commands, function keys	4	Binary, text, graphics	✓	✓	MCI Mail; Easylink; Dialcom	Up to 19.2K/NA	✓	$11,000 to $19,000
Hewlett-Packard Co. Palo Alto, Calif.	HP Desk-Manager	HP 3000/ MPE and MPE/XL	MS-DOS	2M bytes minimum	Unlimited/ unlimited	200	✓	Menus, programmable function keys	Unlimited	Binary, text, graphics	✓	✓	X.400; PROFS; DISOSS	Up to 19.2K/NA		$5,200 to $31,000
Honeywell Bull, Inc. Waltham, Mass.	ONEMail	DPS6 Plus/One Plus	MS-DOS	6M bytes minimum on host	Unlimited/ unlimited	Unlimited	✓	Menus	NA	Binary, text, graphics	✓	✓	DISOSS	Up to 9.6K/ Kermit		$450 to $1,350
Logical Data Corp. Palm Bay, Fla.	Electronic Mail	Modcomp Classic/ MAXIV or MAX32	Not applicable	NA	Unlimited/ unlimited	Unlimited	✓	Menus, commands	None	NA	✓			Up to 19.2K/NA		$5,000 for site license
Lotus Development Corp. Cambridge, Mass.	Lotus Express	Connects only to MCI Mail	MS-DOS	155K bytes	400/400	Unlimited		Menus, pop-up menus	99	Binary, text, graphics	✓	✓	CompuServe	✓	Up to 9.6K/ proprietary	$150 per user
McCormack & Dodge Corp. Natick, Mass.	M:FYT	Any IBM/MVS	Not applicable	100K bytes	Unlimited/ unlimited	50	✓	Menus, pop-up menus, commands		NA				None/None		$10,000
Quadratron Systems, Inc. Westlake Village, Calif.	Q-Main	Any/Unix- or Xenix-based	Not applicable	512K bytes minimum	Unlimited/ unlimited	Unlimited		Menus, commands	9	Binary, text, graphics	✓	✓	Any	Up to 19.2K/all		$800 for basic system; $35,000 for entire package
Wang Laboratories, Inc. Lowell, Mass.	Wang Office	Wang VS Series	Not applicable	NA	Unlimited/ unlimited	Unlimited	✓	Menus	Unlimited	Binary, text, graphics, voice	✓	✓	MCI Mail; PROFS; DISOSS; All-In-1	Not supported	✓	$5,000 to $18,000

All-In-1 = Digital Equipment Corp. office and information system
AT&T Mail = AT&T E-mail
DECmail = DEC E-mail
Dialcom = Dialcom, Inc. service
Easylink = Western Union Corp. service
HP Desk = Hewlett-Packard Co. E-mail

ITT = ITT Corp. service
MCI Mail = MCI Communications Corp. E-mail
NA = Information not available
OIS/VS = Wang Laboratories, Inc. E-mail
PROFS = IBM's Professional Office System
VMS Mail = DEC E-mail
Wang Office = Wang's office and information system

This chart includes a representative selection of vendors in the host-based E-mail system market. Most vendors produce other systems, and many vendors not included manufacture a full range of competitive products. Information for IBM could not be obtained by press time.

SOURCE: TMS CORP., DEVON, PA.

AT&T offers new backup plan

continued from page 1

the mercy of [our] fiber construction program," AT&T's Clark said. AT&T has already installed 23,000 fiber route miles and plans to boost that figure to 30,000 by the end of 1989.

"Large users in a number of different vertical industries are anxiously awaiting this feature," said Steve Sazegari, senior voice analyst with Dataquest, Inc., a San Jose, Calif.-based communications research concern. Firms that view their nets as strategic business tools will be willing to buy NPC, but other users may be reluctant to follow suit, he said.

One T-1 user affected by AT&T's recent cable cut objected to the carrier's plan to offer NPC as an optional feature.

NPC "should be part of AT&T's [T-1 and T-3] services, not something they charge users extra for," said Frank Ferrara, assistant vice-president and communications services manager for Midlantic National Bank in Newark, N.J.

Clark said the carrier will charge users for NCP in order to cover the cost of researching, provisioning and monitoring each backup circuit in Tariff 9. AT&T currently guarantees 99.73% availability annually for each T-1 circuit, he noted.

"That translates into 26½ [hours of downtime] a year. We are trying to assure customers that those 26 hours don't happen at one time," Clark explained. The carrier plans to boost the availability percentage this month and already credits customers whose downtime exceeds that limit.

Clark said AT&T will determine the availability of NPC for each circuit requested before issuing a service order. If no NPC facilities are available, the customer may cancel the request without penalty.

NPC will become available on Jan. 13, pending Federal Communications Commission approval.

NPC pricing consists of a one-time installation fee and a monthly charge. The per-circuit installation charge is $500 for T-1 users and $1,000 for T-3 users. The recurring charge is roughly 15% of AT&T's monthly price for the intercity portion of each circuit to be protected.

AT&T releases plans for PRI

continued from page 3

calls a year. The American Express subsidiary uses 425 operators, who together handle an average of 10,000 calls per hour ("Use of Primary Rate Interface to help firm grow," Oct. 10).

Most early Primary Rate Interface users found INFO-2 to be the most attractive of the two service features, Kauza noted.

Call-By-Call Service Selection, the other service feature, enables customers to use a single Primary Rate Interface T-1 line to access several switched network services at the AT&T network entry point. In the past, users had to dedicate each access line channel to one specific service.

With this Primary Rate Interface feature, a user can, for example, assign seven channels to Megacom and Megacom 800 and create a call group with the remaining 17.

"[The feature] can be used by customers with a full, or close to full, T-1 access line to delay the purchase of the next T-1," Kauza said.

Based on user demand

Kauza said customers that want Primary Rate Interface service should give their AT&T salesperson a list of cities where the service is needed. If the service is not already available from one or more of these cities, the salesperson must submit the list and a standard document to the appropriate regional AT&T headquarters or to AT&T's national headquarters.

According to Kauza, the cities are added to the Primary Rate Interface deployment list, and AT&T equips the central office in each city to support the service. It takes about 26 weeks to load the 4E 11 software that supports the Primary Rate Interface onto the 4ESS switch.

Cities targeted

AT&T 4ESS switches in the following cities will be equipped to support ISDN Primary Rate Interface in the first half of 1988: Cincinnati; Colorado Springs; Detroit; Greensboro, N.C.; Harrisburg, Pa.; Houston; Kansas City, Mo.; Minneapolis; Oakbrook, Ill.; Ojus, Fla.; Philadelphia; Sacramento, Calif.; Salt Lake City; San Antonio, Texas; Tampa, Fla.; Tulsa, Okla.; Washington, D.C.; West Palm Beach, Fla.; and White Plains, N.Y.

> Most early users found INFO-2 to be the most attractive of the two service features.
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AT&T's ISDN Primary Rate Interface will become available in the second half of 1989 in these cities: Albuquerque, N.M.; Austin, Texas; Buffalo, N.Y.; Camden, N.J.; Charlotte, N.C.; Dallas; Dayton, Ohio; Fort Wayne, Texas; Grand Rapids, Mich.; Indianapolis; Lansing, Mich.; Macon, Ga.; New Haven, Conn.; Oklahoma City; Peoria, Ill.; Pittsburgh; Reno, Nev.; San Diego; San Francisco; San Jose, Calif.; Syracuse, N.Y.; Toledo, Ohio; Waukesha, Wisc.; and Wayne, Pa.

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Group develops train standard

continued from page 13

ternal design of system components is left up to the vendors.

Although railroads can choose to implement as many ATCS components as they want, a full-blown system would consist of the following: a centralized dispatch center; a series of track-bed transponders used for locating trains; a workstation on the locomotive for collecting and displaying location data and communicating with the dispatch center; and a network for data transmission between trains and the dispatch center.

One of the major benefits ATCS gives railroads is the ability to monitor trains even when they traverse a competitor's track, provided that competitor is equipped with an ATCS-compatible system.

This capability exists today only when one company uses another's track as part of a prearranged agreement. Even then, the engineer has to be aware of the nuances of the other's signaling lights since they vary from one company to another, Detmold said. When a train is forced to detour onto a competitor's track, somebody familiar with that track must be on board.

Union Pacific Railroad Co. has already begun testing a network that complies with ATCS. The railroad expects its network to save the company at least $56 million a year ("Networks put railroads on track to bigger profits," *NW*, Nov. 7).

Now it is up to the individual railroad companies to seek bids from vendors that can install ATCS-compatible networks. Besides Union Pacific, Detmold said he expects Norfolk Southern Corp., CSX Corp., Canadian National Railway Co. and Canadian Pacific, Ltd. railroads will soon announce plans to implement ATCS.

"We tell all our customers about the economical Codex 19.2 kbps modem because it's the best value around."

See us on page 51.

Greyhound runs with new net

continued from page 1

hound's ticketing offices will be equipped with one or more AT&T Model 6300 PC microcomputers running specialized ticketing software from Gateway Ticketing Systems, Inc. of Boyertown, Pa.

The network, dubbed Gateway after the software vendor, is replacing the 5-year-old IBM point-of-sale ticketing devices currently used. Compared to those devices, Gateway gives agents easier and faster access to much larger amounts of data about the company's schedules and fares. In addition, agency owners now receive detailed accounting and financial reports.

Gateway uploads all this sales and financial data to corporate mainframes every night. Corporate marketing and financial staffs can use the data to evaluate the effectiveness and profitability of new services, fares and routes, Lambert said.

The existing IBM system, to be phased out by Feb. 1, was originally developed for retail sales. Greyhound agents use a 10-key keypad and a number of predefined keys to enter reservation information into the device, which holds limited fare and route information on only 100 cities. If the passenger's trip included other cities, the agent had to consult a hard-copy list and enter the ticket information manually.

The entire ticketing process averaged about three minutes, Lambert said. "It was slow. We were having to hold up schedules because passengers weren't being ticketed fast enough," he said.

In addition, some of the fare and route information was derived from publications distributed periodically and often lagged behind the latest data available to the firm's 1,400 telephone operators, who field fare inquiries.

Greyhound motored along with the IBM system until March 1987, when parent company Greyhound Corp., headquartered in Phoenix, sold off the bus line.

Six months later, management at the newly created Greyhound Line, Inc. assembled what it called a Challenge Team. This team identified 20 key problem areas that urgently needed attention. Lambert headed up the group that focused on fully automating ticketing and data collection.

A major factor in the company's decision to use the Gateway software and AT&T microcomputers was that AT&T promised fast nationwide service and maintenance of its personal computers and the other equipment used in Gateway.

The new system

In the new network design, Greyhound ticketing locations have one or more Gateway units, each consisting of a 6300 PC, a thermal printer for printing out continuous-feed tickets and a dot matrix printer for creating various reports. The microcomputer uses MS-DOS 3.1 and comes with a 30M-byte hard disk as well as a dual serial card with a parallel port. The computer is also equipped with a modem for dialing up a 9.6K bit/sec line to the data center.

At large urban bus terminals, Gateway computers are chained together with RJ-11 cables. In this configuration, one computer serves as the master Gateway, processing the daily consolidated reports from the others and managing all communications with the data center.

At the data center, a quartet of AT&T microcomputers polls the remote master Gateway computers nightly for data uploads. Then, by emulating IBM 3277 terminals attached to the communications processor of Greyhound's IBM 3081K host, the microcomputers pass the data along to the host-based marketing and financial data bases and applications.

> Greyhound can, for the first time, offer a range of ticket prices for each route.
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The local memory and processing power of the microcomputers puts fare and route data for Greyhound's 15,000 stops at the agents' fingertips. A Gateway microcomputer can be preprogrammed with data on as many as 1,000 routes, which comprise most of the daily business at any given location. Information on other routes is now stored locally and can be called up using Gateway menus, instead of thumbing through printed guides. Using Gateway, agents can now process tickets in a minute or less.

Just as importantly, Greyhound can, for the first time, offer travelers a range of ticket prices for each route. The former POS system processed adult and child fares and a one-price national pass. With Gateway, Greyhound now offers nine different price structures. Ticket prices can vary according to the age of the passenger, day of travel, the purchase date and other variables.

Because sales data is uploaded nightly, corporate decision makers can see, among other things, how many fares of a given type were sold the day before in different markets.

Likewise, the daily uploading of the agents' financial data gives the corporate accounting staff a tighter grip on revenue figures, costs and cash flow, he said.

Greyhound eventually plans to create driver itineraries, called tally cards, electronically, Lambert said. Tally cards are important because drivers depend on them to track which passengers and packages are getting on or off at each stop. This is all done manually with the IBM net.

Calendar

Dec. 8, Los Angeles — Network Management for the Banking/Financial Industry. Contact: Communications Timeplex, Inc., 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675; (201) 391-1111.

Dec. 8-9, Toronto — Preparing for ISDN: Business Implications of a Technical Revolution. Contact: Angus TeleManagement Group, Inc., 1400 Bayly St., Pickering, Ont. L1W3R2, Canada; (416) 420-5050.

Dec. 13-14, Washington, D.C. — National EDI Systems Conference & Exhibit. Contact: Transportation Data Coordinating Committee, 1101 17th St., N.W., Washington, D.C. 20036; (202) 293-5514.

Dec. 13-14, Seattle — Local Area Networks. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015; (201) 478-5400.

Dec. 15-16, Dearborn, Mich. — Artificial Intelligence: Understanding and Developing Strategic Applications. Contact: Society of Manufacturing Engineers, Professional Education Dept., P.O. Box 930, One SME Drive, Dearborn, Mich. 48121; (313) 271-0039.

Jan. 9-10, Washington, D.C. — Enterprise T-1 Networks: Emerging Strategies. Contact: Telecom Publishing Group, Conference Registrar, P.O. Box 1455, Alexandria, Va. 22313; (703) 683-4100.

Jan. 11-13, Dallas — Basics of Telecommunications. Contact: International Communications Association, Suite 710, LB-89, 12750 Merit Drive, Dallas, Texas 75251; (214) 233-3889.

Jan. 17-19, New Orleans — Fourth Annual Software Management Strategies Conference. Contact: Gartner Group, Inc., P.O. Box 10212, 56 Top Gallant Road, Stamford, Conn. 06904; (203) 967-6757.

Jan. 18-21, Palm Springs, Calif. — National Association of Telecommunications Dealers 1989 Winter Conference. Contact: National Association of Telecommunications Dealers, 1255 23rd St., N.W., Washington, D.C. 20037; (202) 872-8420.

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Users brainstorm on OSI migration

continued from page 1

"But if you don't start doing things now, you won't be able to deliver OSI functionality when users start demanding it two or three years down the pike."

Dick Lefkon, assistant vice-president in the data processing department of New York-based Citicorp Investment Bank, cautioned users, however, against going overboard in pursuit of OSI. "Anyone who tells you to throw out old plant and install OSI is absolutely insane," he said. "The way to install OSI is one gateway at a time and only where appropriate."

User strategies

Several users speaking at the event outlined their own OSI migration strategies.

Most said they are moving cautiously in migrating to the standard. But one user at the meeting said he is plunging his organization headfirst into OSI.

Kenneth Lini, a communications manager with the U.S. Department of Agriculture in Fort Collins, Colo., oversees a sprawling network that links tens of thousands of minicomputers in nearly every county in the U.S. and more than a dozen mainframes in three large data centers. These computers exchange data over Telenet Communications Corp.'s public-switching network.

Two years ago, Lini said, he decided to link the computers using a full range of OSI capabilities. But he said a lack of available products prevented that.

Undaunted, Lini forged ahead with his own OSI-based networking systems. He developed software, based on the seven-layer OSI model, that converts data into X.25 for transmission between Department of Agriculture computers. Disparate computers can exchange data as peers rather than communicate through limited methods such as terminal emulation.

Once fully implemented, the system will cut nearly $10 million off the department's average annual data communications expenditures of $30 million, he estimated. In its first application, bulk file transfers between minicomputers, the system is cutting data communications costs by $3 million annually.

Lini said the Agriculture Department achieves savings in two ways. First, the department saves money by eliminating the need to convert data among several different proprietary formats. Second, bulk data transfers among peer computers takes less time than transfers between computers using terminal emulation. This saves the agency money because Telenet charges time-sensitive rates for network usage.

The biggest benefit of the system, however, is that it makes it easier for users to access files in disparate computers.

"Moving information around becomes almost seamless," Lini said. "When you get down to it, this is the real justification for the system."

FISO's standard initiative

The Financial Industry Standards Organization (FISO), based in New York, is also moving toward OSI. FISO represents about 20 securities firms and information services vendors that are trying to establish common communications standards for the financial services industry. These standards would help ease the movement of data between stock exchanges, brokerages and other companies.

FISO was formed early this year. According to David Isherwood, assistant vice-president in the information services division at Shearson Lehman Hutton, Inc. in New York and a member of the group, FISO will use OSI standards whenever possible but will also rely on proprietary networking schemes.

Isherwood said FISO is taking this approach because it cannot afford to wait for OSI to become available.

"We need solutions right now," he said. "We can't wait for every OSI standard to come about."

Vanderbilt opts for T-1 links to POP

continued from page 2

Joseph Fulvio, research director for Information Publishing Corp., a Houston-based research company, said AT&T's new approach is simply the latest development in a competition that has already given customers both better service and lower rates.

"Operator-assisted calling is destined to become a commodity service," Fulvio said. He also said it is surprising that AT&T did not try this earlier.

In 1986, Vanderbilt was paying South Central Bell for two T-1 links used to deliver the university's 0+ calls to one of the Bell company's central office switches, where the calls were then passed on to AT&T.

"I asked myself, 'Why are we paying South Central Bell for these 48 trunks when they're profiting by them?' " Vagelos said. "They should be provided at no charge. In addition, fraudulent calls, such as calls made with stolen credit cards and [unverified] third-party billing, were being billed to the university."

The university began using an AOS provider after South Central Bell turned down Vagelos' suggestion that the BOC offer a commission to the university on 0+ calls, he said. When the AOS provider raised its rates and billing problems developed, Vagelos said he proposed the idea of direct access to Molettiere.

"It seemed like a reasonable request to me," Molettiere said.

Now Vanderbilt is paying South Central Bell $24,000 a year for T-1 lines that formerly cost the school $57,600 annually, while receiving a commission from AT&T to defray its costs. AT&T and Vanderbilt declined to discuss the details of the commission.

AT&T operators also are responsible for screening for phone fraud, so Vanderbilt will not have to pay for fraudulent calls.

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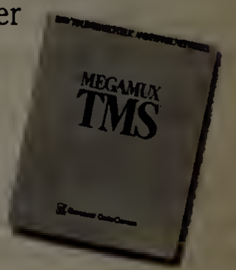

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